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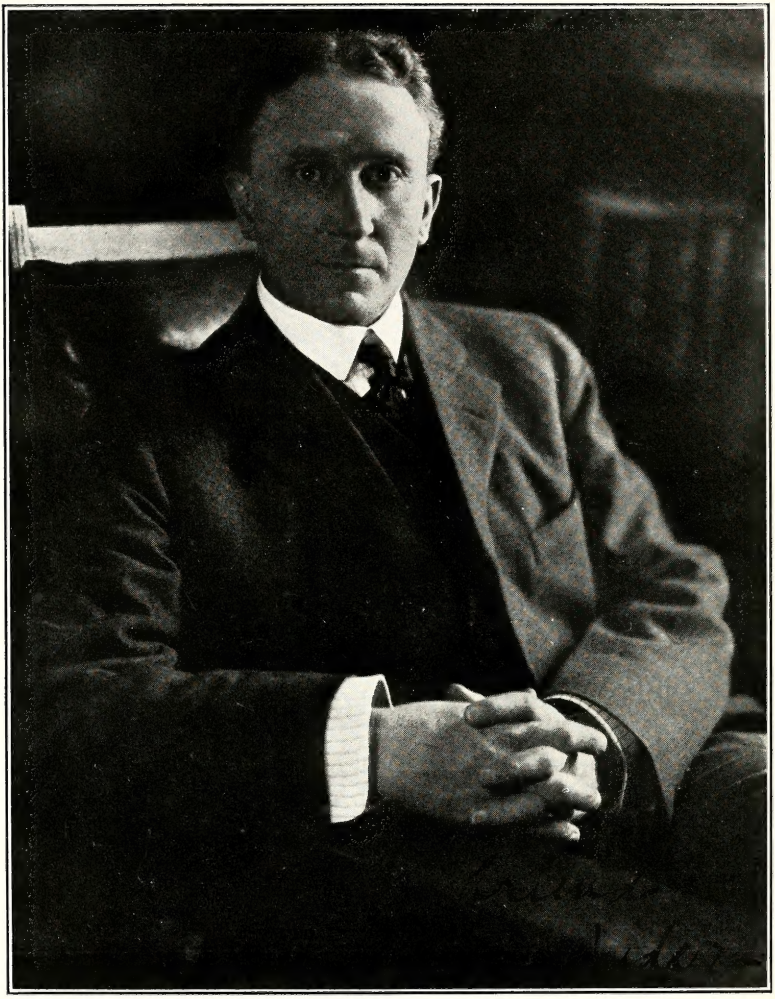

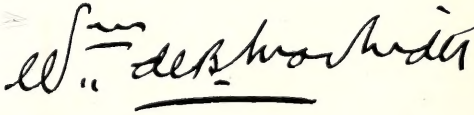

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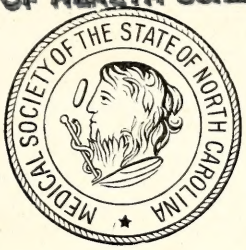

SEVENTY-THIRD ANNUAL SESSION

HELD AT

WRIGHTSVILLE BEACH, N. C.

JUNE 14, 15 and 16, 1926

PRESIDENT

WM. DEB. MACNIDER, M.D., F.A.C.P., CHAPEL HILL

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"It is understood that the Society is not to be considered as indorsing all the views and opinions of authors of papers published in the Transactions of the Society." —*Extract from By-Laws, Chapter 10, Section 8.*

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EARLY HISTORY OF THE NORTH CAROLINA MEDICAL SOCIETY, FROM ORGANIZATION TO 1804

Date	Place	President	Vice-Presidents	Corresponding Secretary	Secretary	Recording Secretary	Treasurer	Censors
Dec. 17, 1799, or April 16, 1800	Raleigh	Richard Fenner	Nathaniel Loomis, John Claiborne	Calvin Jones		Wm. B. Hill	Cargill Massenburg	Sterling Wheaton James Webb Jas. John Pasteur Jason Hand
Dec. 1, 1800	Raleigh	Richard Fenner			Sterling Wheaton			
Dec. 1, 1801	Raleigh	John C. Osborne	Thomas Mitchell Richard Fenner	Calvin Jones	Sterling Wheaton		Cargill Massenburg	James Webb John Sibley
1802	Raleigh	John C. Osborne		Calvin Jones				
1803	Raleigh	John C. Osborne		Calvin Jones				
1804	Raleigh	John C. Osborne		Calvin Jones				

*Missing Data Not to Be Found in Records

	Date	Place of Meeting	Number in Attendance	President	Vice-Presidents*	Secretary	Treasurer*	Members on Roll*	Honorary Members*	Honorary Fellows*
	1849	Raleigh	25	F. J. Hill	.....	W. H. McKee	.....	25	.....	.....
1	1850	Raleigh	21	E. Strudwick	F. J. Haywood, C. E. Johnson, J. E. Williamson, W. G. Thomas.	W. H. McKee	W. G. Hill	38	9	.....
2	1851	Raleigh	23	E. Strudwick	C. E. Johnson.	W. H. McKee	W. G. Hill	46	9	.....
3	1852	Wilmington	38	J. E. Williamson	Thomas N. Cameron, William G. Hill, Johnston B. Jones, N. J. Pittman.	E. B. Haywood	J. J. W. Tucker	72	12	.....
4	1853	Fayetteville	24	J. E. Williamson	William G. Hill, Johnston B. Jones, J. B. G. Myers, N. J. Pittman.	W. W. Harris	Daniel Dupree	80	14	.....
5	1854	Raleigh	37	J. H. Dickson	N. J. Pittman, J. B. G. Myers, J. Graham Tull, A. D. McLean.	S. S. Satchwell	Daniel Dupree	84	17	.....
6	1855	Salisbury	23	J. H. Dickson	J. Graham Tull, Owen Hadley, A. D. McLean, Hugh Kelly.	S. S. Satchwell	J. B. Dunn	96	18	.....
7	1856	Raleigh	35	C. E. Johnson	Marcellus Whitehead, E. R. Gibson, Johnston B. Jones, O. F. Manson.	S. S. Satchwell	J. B. Dunn	101	22	.....
8	1857	Edenton	25	C. E. Johnson	Marcellus Whitehead, O. F. Manson, H. W. Faison, E. T. Gibson.	W. G. Thomas	J. B. Dunn	113	16	.....
9	1858	New Bern	69	W. H. McKee	Edward Warren, C. W. Graham, Caleb Winslow, A. B. Pierce.	W. G. Thomas	J. B. Dunn	172	18	.....
10	1859	Statesville	81	W. H. McKee	James G. Ramsey, P. E. Hines, J. R. Mercer, W. T. Howard.	W. G. Thomas	C. W. Graham	.....	.....	.....
11	1860	Washington	64	N. J. Pittman	P. T. Henry, R. H. Winborne, M. Whitehead, T. S. Leach.	W. G. Thomas	C. W. Graham	233	18	.....
12	1861	Morganton	23	N. J. Pittman	J. J. Summerell, C. T. Murphy, G. W. Hodges, W. A. B. Norcom.	W. G. Thomas	C. W. Graham	244	18	.....
13	1866	Raleigh	20	J. J. Summerell	E. Burke Haywood, R. H. Winborne, W. L. Barrow, J. W. Jones.	W. G. Thomas	C. W. Graham	.....	.....	.....
14	1867	Tarboro	41	W. G. Thomas	.....	S. S. Satchwell	C. W. Graham	288	11	.....
15	1868	Warrenton	27	S. S. Satchwell	Hugh Kelly, George A. Foote, Charles J. O'Hagan, J. H. Baker.	Thomas F. Wood	J. W. Jones	.....	.....	.....
16	1869	Salisbury	36	E. B. Haywood	Thomas E. Wilson, A. B. Pierce, C. T. Murphy, M. A. Locke.	Thomas F. Wood	J. W. Jones	.....	.....	.....
17	1870	Wilmington	38	C. J. O'Hagan	E. A. Anderson, F. N. Luckey, W. R. Sharpe, R. L. Payne.	Thomas F. Wood	J. W. Jones	.....	.....	.....
18	1871	Raleigh	35	Hugh Kelly	D. N. Patterson, R. C. Pearson, J. B. Seavy, G. L. Kirby.	Thomas F. Wood	J. W. Jones	.....	.....	.....
19	1872	New Bern	34	W. G. Hill	H. W. Faison, R. I. Hicks, G. H. Macon, W. A. B. Norcom.	James McKee	J. W. Jones	.....	.....	.....

20	1873	Statesville	43	M. Whitehead	W. T. Ennett, William Little, Charles Duffy, T. P. Jerman.	James McKee	H. T. Bahnson	.....	.....	.....
21	1874	Charlotte	56	W. A. B. Norcom	J. B. Jones, R. F. Lewis, C. G. Cox, J. L. Knight.	James McKee	H. T. Bahnson	.....	.....	.....
22	1875	Wilson	60	J. W. Jones	Walker Debnam, J. A. Gibson, William Little, D. N. Patterson.	James McKee	H. T. Bahnson	148	5	.....
23	1876	Fayetteville	33	Peter E. Hines	J. H. Baker, G. G. Smith, T. D. Haigh, J. K. Hall.	James McKee	H. T. Bahnson	157	4	.....
24	1877	Salem	42	George A. Foote	J. K. Hall, B. W. Robinson, A. Holmes, A. A. Hill.	James McKee	A. G. Carr	177	4	.....
25	1878	Goldsboro	79	R. L. Payne	E. M. Rountree, Richard Anderson, S. B. Flowers, L. A. Stith.	L. J. Picot	A. G. Carr	194	6	.....
26	1879	Greensboro	109	Chas. Duffy, Jr.	J. A. Gibson, Willis Alston, James McKee, A. A. Hill.	L. J. Picot	A. G. Carr	198	6	.....
27	1880	Wilmington	105	J. F. Shaffner	J. K. Hall, W. C. McDuffie, W. R. Wilson, R. F. Lewis.	L. J. Picot	A. G. Carr	225	6	.....
28	1881	Asheville	92	R. B. Haywood	J. E. McRee, W. H. Lilly, R. H. Speight, W. J. H. Bellamy.	L. J. Picot	A. G. Carr	254	6	.....
29	1882	Concord	65	Thos. F. Wood	T. J. Moore, D. J. Cain, S. E. Evans, John McDonald.	L. J. Picot	A. G. Carr	297	7	.....
30	1883	Tarboro	112	J. K. Hall	A. W. Knox, J. M. Hadley, E. S. Foster, John Whitehead.	L. J. Picot	A. G. Carr	310	7	.....
31	1884	Raleigh	112	A. B. Pierce	F. W. Potter, G. W. Graham, R. Dillard, G. W. Long.	L. J. Picot	A. G. Carr	348	7	.....
32	1885	Durham	173	W. C. McDuffie	James McKee, T. E. Anderson, W. H. Whitehead, A. G. Carr.	W. C. Murphy	R. L. Payne, Jr.	424	6	.....
33	1886	New Bern	113	Joseph Graham	H. T. Bahnson, L. J. Picot, J. L. McMillan, W. W. Faison.	J. M. Baker	C. M. Van Poole	438	7	.....
34	1887	Charlotte	112	H. T. Bahnson	G. G. Smith, J. L. Nicholson, C. M. Van Poole, H. B. Ferguson.	J. M. Baker	C. M. Van Poole	452	7	.....
35	1888	Fayetteville	133	T. D. Haigh	W. T. Ennett, J. A. Dunn, T. E. Anderson.	J. M. Baker	M. P. Perry	306	6	.....
36	1889	Elizabeth C.	50	W. T. Ennett	W. J. Jones, S. W. Stevenson, G. W. Long.	J. M. Baker	M. P. Perry	410	6	.....
37	1890	Oxford	160	G. G. Thomas	R. L. Payne, Jr., Richard Dillard, S. D. Booth.	J. M. Hays	M. P. Perry	414	6	.....
38	1891	Asheville	135	R. H. Lewis	S. W. Battle, J. L. Nicholson, W. H. Lilly.	J. M. Hays	M. P. Perry	422	6	.....
39	1892	Wilmington	162	W. T. Cheatham	T. S. Burbank, J. W. Long, W. H. H. Cobb, W. D. Hilliard.	J. M. Hays	M. P. Perry	431	6	.....
40	1893	Raleigh	221	J. W. McNeill	W. C. Galloway, H. H. Harris, J. M. Hadley, Thomas Hill.	R. D. Jewett	M. P. Perry	447	5	3

*Missing Data Not to Be Found in Records.

	Date	Place of Meeting	Number in Attendance*	President	Vice-Presidents	Treasurer	Secretary	Members on Roll	Honorary Members	Honorary Fellows
41	1894	Greensboro	166	W. H. H. Cobb	J. A. Hodges, R. W. Tate, Willis Alston, M. H. Fletcher.	R. D. Jewett	M. P. Perry	454	5	3
42	1895	Goldsboro	.....	J. H. Tucker	J. Howell Way, W. H. Harrell, O. McMullan, C. A. Misenheimer.	R. D. Jewett	M. P. Perry	436	7	3
43	1896	Winston-Salem	158	R. L. Payne	S. D. Booth, J. P. Munroe, J. A. Burroughs, J. E. Grimsley.	R. D. Jewett	M. P. Perry	452	7	3
44	1897	Morehead City	103	P. L. Murphy	J. C. Walton, A. A. Kent, M. R. Adams, B. L. Long.	R. D. Jewett	M. P. Perry	406	6	3
45	1898	Charlotte	.....	Francis Duffy	E. C. Register, A. T. Cotton, J. B. H. Knight, F. H. Russell.	R. D. Jewett	M. P. Perry	437	6	21
46	1899	Asheville	152	L. J. Picot	I. W. Faison, J. W. White, H. H. Dodson, W. C. Brownson.	Geo. W. Pressley	G. T. Sikes	489	6	16
47	1900	Tarboro	115	George W. Long	C. M. Van Poole, James M. Parrott, T. B. Williams, W. D. Hilliard.	Geo. W. Pressley	G. T. Sikes	482	6	21
48	1901	Durham	186	Julian M. Baker	M. H. Fletcher, C. A. Julian, D. A. Stanton, E. M. Summerell.	Geo. W. Pressley	G. T. Sikes	515	5	18
49	1902	Wilmington	147	Robert S. Young	A. G. Carr, E. D. Dixon-Carroll, I. M. Taylor, J. M. Parrott.	Geo. W. Pressley	G. T. Sikes	546	5	20
50	1903	Hot Springs	155	A. W. Knox	E. G. Moore, C. A. Julian, W. W. McKenzie, J. L. Nicholson.	J. Howell Way	G. T. Sikes	530	6	19
51	1904	Raleigh	326	H. B. Weaver	John Hey Williams, John C. Rodman, S. F. Pfohl.	J. Howell Way	G. T. Sikes	1,033	8	17
52	1905	Greensboro	361	David T. Tayloe	C. A. Julian, John T. Burrus, I. W. Faison.	J. Howell Way	G. T. Sikes	1,175	8	17
53	1906	Charlotte	406	E. C. Register	L. B. MacBrayer, W. H. Cobb, Jr., W. O. Spencer.	J. Howell Way	G. T. Sikes	1,234	8	16
54	1907	Morehead City	217	Samuel D. Booth	C. M. Strong, J. E. McLaughlin, W. F. Hargrove.	David A. Stanton	H. McK. Tucker	888	7	16
55	1908	Winston-Salem	372	J. Howell Way..	J. E. Stokes, J. A. Turner, W. H. Dixon.	David A. Stanton	H. McK. Tucker	998	7	28
56	1909	Asheville	337	J. F. Highsmith	C. M. Van Poole, D. A. Garrison, D. O. Dees.	David A. Stanton	H. McK. Tucker	1,067	7	25
57	1910	Wrightsville Beach	276	†J. A. Burroughs E. J. Wood	E. J. Wood, John Q. Myers, L. D. Wharton.	David A. Stanton	H. D. Walker	1,080	8	35
58	1911	Charlotte	412	C. M. VanPoole	J. V. McGougan, W. E. Warren, L. N. Glenn.	David A. Stanton	H. D. Walker	880	8	45
59	1912	Henderson-ville	296	A. A. Kent	J. P. Munroe, W. P. Horton, J. G. Murphy.	David A. Stanton	H. D. Walker	950	8	44
60	1913	Morehead City	232	J. P. Munroe	F. R. Harris, E. S. Bulluck, L. B. Morse.	John A. Ferrell	H. D. Walker	1,133	8	40
61	1914	Raleigh	431	J. M. Parrott	E. T. Dickinson, J. T. J. Battle, D. E. Sevier.	John A. Ferrell	H. D. Walker	1,228	8	47
62	1915	Greensboro	443	L. B. McBrayer	J. J. Phillips, C. W. Moseley, S. M. Crowell.	John A. Ferrell	H. D. Walker	1,221	9	68

†Died during his term of office; succeeded by E. J. Wood, first vice-president.

63	1916	Durham	406	M. H. Fletcher Charles O'H.	J. L. Nicholson, L. N. Glenn, W. H. Hardison.	Benj. K. Hays	W. M. Jones	1,228	10	79
64	1917	Asheville	280	Laughinghouse	D. J. Hill, J. L. Spruill, J. H. Shuford.	Benj. K. Hays	W. M. Jones	1,271	11	81
65	1918	Pinehurst	291	I. W. Faison	Wm. deB. MacNider, Jos. B. Greene, Ben F. Royal.	Benj. K. Hays	W. M. Jones	1,087	11	81
						Secy-Treas.	Acting			
66	1919	Pinehurst	335	Cyrus Thompson	J. W. Halford, T. W. Davis, A. McN. Blair.	Benj. K. Hays	L. B. McBrayer	1,306	11	100
67	1920	Charlotte	479	C. V. Reynolds	H. D. Walker, F. Stanley Whitaker, Thos. I. Fox.	Benj. K. Hays	L. B. McBrayer	1,497	12	100
68	1921	Pinehurst	404	T. E. Anderson	C. S. Lawrence, W. H. Ward, J. M. Manning.	Benj. K. Hays	L. B. McBrayer	1,491	12	93
						Secretary-Treasurer				
69	1922	Winston-Salem	507	H. A. Royster	W. T. Parrott, B. C. Nalle, J. R. McCracken.	L. B. McBrayer		1,571	12	100
70	1923	Asheville	356	J. W. Long	F. M. Hanes, T. C. Johnson, B. L. Long.	L. B. McBrayer		1,592	9	101
71	1924	Raleigh	525	J. V. McGougan	J. L. Spruill, ‡Eugene B. Glenn, D. A. Garrison.	L. B. McBrayer		1,604	9	106
72	1925	Pinehurst	550	Albert Anderson	W. L. Dunn, A. E. Bell, K. G. Averitt.	L. B. McBrayer		1,657	10	116
73	1926	Wrightsville Beach	445	Wm. deB. MacNider	J. P. Matheson, W. W. Dawson, H. H. Bass.	L. B. McBrayer		1663	10	107

‡Died during his term of office.

ROSTER OF MEMBERS OF THE VARIOUS BOARDS OF MEDICAL EXAMINERS OF THE STATE OF NORTH CAROLINA

FIRST BOARD

JAMES H. DICKSON, Wilmington 1859-1866
CHARLES E. JOHNSON, Raleigh 1859-1866
CALEB WINSLOW, Hertford 1859-1866
OTIS F. MANSON, Townsville 1859-1866
WILLIAM H. McKEE, Raleigh 1859-1866
CHRISTOPHER HAPPOLDT, Morganton 1859-1866
J. GRAHAM TULL, New Bern 1859-1866
SAMUEL T. IREDELL, Secretary 1859-1866

SECOND BOARD

N. J. PITTMAN, Tarboro 1866-1872
E. BURKE HAYWOOD, Raleigh 1866-1872
R. H. WINBORNE, Edenton 1866-1872
S. S. SATCHWELL, Rocky Point 1866-1872
J. J. SUMMERELL, Salisbury 1866-1872
R. B. HAYWOOD, Raleigh 1866-1872
M. WHITEHEAD, Salisbury 1866-1868
J. F. SHAFFNER, Salem 1868-1872
WILLIAM LITTLE, Secretary 1866-1867
THOMAS F. WOOD, Secretary, Wilmington 1867-1872

THIRD BOARD

CHARLES J. O'HAGAN, Greenville 1872-1878
W. A. B. NORCOM, Edenton 1872-1878
C. TATE, Murphy 1872-1878
GEORGE A. FOOTE, Warrenton 1872-1878
J. W. JONES, Tarboro 1872-1878
R. L. PAYNE, Lexington 1872-1878
CHARLES DUFFY, JR., Secretary, New Bern 1872-1878

FOURTH BOARD

PETER E. HINES, Raleigh 1878-1884
THOMAS D. HAIGH, Fayetteville 1878-1884
GEORGE L. KIRBY, Goldsboro 1878-1884
THOMAS F. WOOD, Wilmington 1878-1884
JOSEPH GRAHAM, Charlotte 1878-1884
[1]ROBERT I. HICKS, Williamston 1878-1880
[2]RICHARD H. LEWIS, Raleigh 1880-1884
HENRY T. BAHNSON, Secretary, Salem 1878-1884

FIFTH BOARD

WILLIAM R. WOOD, Scotland Neck 1884-1890
AUGUSTUS W. KNOX, Raleigh 1884-1890
FRANCIS DUFFY, New Bern 1884-1890
PATRICK L. MURPHY, Morganton 1884-1890
WILLIS ALSTON, Littleton 1884-1890
J. A. REAGAN, Weaverville 1884-1890
W. J. H. BELLAMY, Secretary, Wilmington 1884-1890

SIXTH AND SEVENTH BOARDS

R. L. PAYNE, JR., Lexington 1890-1892
GEORGE W. PUREFOY, Asheville 1890-1892
GEORGE G. THOMAS, Wilmington 1890-1894
ROBERT S. YOUNG, Concord 1890-1894
WILLIAM H. WHITEHEAD, Rocky Mount 1890-1896
GEORGE W. LONG, Graham 1890-1896
L. J. PICOT, Secretary, Littleton 1890-1896
JULIAN M. BAKER, Tarboro 1892-1898
H. B. WEAVER, Secretary, Asheville 1892-1898
[3]J. M. HAYS, Greensboro 1894-1897
[4]KEMP P. BATTLE, JR., Raleigh 1897-1900

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[1]Resigned before expiration of term.
[2]Elected for unexpired term of Dr. Hicks.
[3]Died before the expiration of his term.
[4]Elected to serve unexpired term of Dr. Hays.

[1]THOMAS S. BURBANK, Wilmington 1894-1898
[2]WILLIAM H. H. COBB, Goldsboro 1898-1900
[1]RICHARD H. WHITEHEAD, Chapel Hill 1896-1898
[3]J. HOWELL WAY, Secretary, Waynesville 1898-1902
DAVID T. TAYLOE, Washington 1896-1902
THOMAS E. ANDERSON, Secretary, Statesville 1896-1902
[4]ALBERT ANDERSON, Wilson 1898-1902
[4]EDWARD C. REGISTER, Charlotte 1898-1902
[4]THOMAS S. McMULLAN, Hertford 1900-1902
[4]JOHN C. WALTON 1900-1902

EIGHTH BOARD

A. A. KENT, Lenoir 1902-1908
CHARLES O'H. LAUGHINGHOUSE, Greenville 1902-1908
M. H. FLETCHER, Asheville 1902-1908
JAMES M. PARROTT, Kinston 1902-1908
J. T. J. BATTLE, Greensboro 1902-1908
FRANK H. RUSSELL, Wilmington 1902-1908
[1]GEORGE W. PRESSLY, Secretary, Charlotte 1902-1906
[5]G. T. SIKES, Secretary, Grissom 1906-1908

NINTH BOARD

LEWIS B. McBRAYER, Asheville 1908-1914
JOHN C. RODMAN, Washington 1908-1914
WILLIAM W. McKENZIE, Salisbury 1908-1914
HENRY H. DODSON, Greensboro 1908-1914
JOHN BYNUM, Winston-Salem 1908-1914
J. L. NICHOLSON, Richlands 1908-1914
BENJ. K. HAYS, Secretary, Oxford 1908-1914

TENTH BOARD

ISAAC M. TAYLOR, Morganton 1914-1920
JOHN Q. MYERS, Charlotte 1914-1920
JACOB F. HIGHSMITH, Fayetteville 1914-1920
MARTIN L. STEVENS, Asheville 1914-1920
[6]CHARLES T. HARPER, Wilmington 1914-1915
[7]EDWIN G. MOORE, Elm City 1915-1920
[8]JOHN G. BLOUNT, Washington 1914-1920
HUBERT A. ROYSTER, Secretary, Raleigh 1914-1920

ELEVENTH BOARD

LESTER A. CROWELL, Lincolnton 1920-1926
WILLIAM P. HOLT, Duke 1920-1926
J. GERALD MURPHY, Wilmington 1920-1926
LUCIUS N. GLENN, Gastonia 1920-1926
CLARENCE A. SHORE, Raleigh 1920-1926
WILLIAM M. JONES, Greensboro 1920-1926
KEMP P. B. BONNER, Secretary, Morehead City 1920-1926

TWELFTH BOARD

W. W. DAWSON, Grifton 1926-1932
T. W. M. LONG, Roanoke Rapids 1926-1932
W. HOUSTON MOORE, Wilmington 1926-1932
J. K. PEPPER, Winston-Salem 1926-1932
PAUL H. RINGER, Asheville 1926-1932
FOY ROBERSON, Durham 1926-1932
JOHN W. MacCONNELL, Secretary, Davidson 1926-1932

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[1]Resigned before the expiration of his term.
[2]Elected to serve the unexpired term of Dr. Burbank.
[3]Elected to serve the unexpired term of Dr. Whitehead.
[4]Elected for short term expiring in 1902.
[5]Elected to serve the unexpired term of Dr. Pressly.
[6]Died before the expiration of his term.
[7]Elected to serve the unexpired term of Dr. Harper.
[8]Died a few months before the expiration of his term; such a short time that the vacancy was not filled.

NOTE: In 1890 the Medical Society of the State of North Carolina adopted the plan of electing members of the Board in such a manner that the terms would expire at different intervals of two years. This practice was followed for twelve years, or until 1902, when the plan was abandoned; an equivalent of two legal terms of six years each. It is evident that the Society arranged to abandon the policy as early as 1898, as two members were elected for short terms, and two years later two other members were elected for still shorter terms. It is therefore impossible to separate the sixth and seventh Boards, since the membership was overlapping.

ROSTER OF MEMBERS NORTH CAROLINA STATE BOARD OF HEALTH FROM ORGANIZATION IN 1877 TO 1926

Name	Address	Appointed by	Term
S. S. Satchwell, M.D., President	Rocky Point	State Society	1877 to 1878
Thomas F. Wood, M.D., Secretary	Wilmington	State Society	1877 to 1878
Joseph Graham, M.D.	Charlotte	State Society	1877 to 1878
Charles Duffy, Jr., M.D.	New Bern	State Society	1877 to 1878
Peter E. Hines, M.D.	Raleigh	State Society	1877 to 1878
George A. Foote, M.D.	Warrenton	State Society	1877 to 1878
S. S. Satchwell, M.D., President	Rocky Point	State Society	1878 to 1884
Thomas F. Wood, M.D., Secretary	Wilmington	State Society	1878 to 1884
Charles J. O'Hagan, M.D., President	Greenville	State Society	1878 to 1882
George A. Foote, M.D.	Warrenton	State Society	1878 to 1882
Marcellus Whitehead, M.D.	Salisbury	State Society	1878 to 1880
R. L. Payne, M.D.	Lexington	State Society	1878 to 1880
H. G. Woodfin, M.D.	Franklin	Gov. Z. B. Vance	1878 to 1880
A. R. Ledeux, Chemist	Chapel Hill	Gov. Z. B. Vance	1878 to 1880
William Cain, Civil Engineer	Charlotte	Gov. Z. B. Vance	1878 to 1880
R. L. Payne, M.D.	Lexington	State Society	1881 to 1887
M. Whitehead, M.D., President	Salisbury	State Society	1881 to 1884
J. M. Lyle, M.D.	Franklin	Gov. T. J. Jarvis	1881 to 1883
William Cain, Civil Engineer	Charlotte	Gov. T. J. Jarvis	1881 to 1883
W. G. Simmons, Chemist	Wake Forest	Gov. T. J. Jarvis	1881 to 1883
J. W. Jones, M.D., President	Wake Forest	State Society	1883 to 1889
John McDonald, M.D.	Washington	State Society	1883 to 1889
S. H. Lyle, M.D.	Franklin	Gov. T. J. Jarvis	1883 to 1885
W. G. Simmons, Chemist	Wake Forest	Gov. T. J. Jarvis	1883 to 1885
Arthur Winslow, Civil Engineer	Raleigh	Gov. T. J. Jarvis	1883 to 1886
R. H. Lewis, M.D.	Raleigh	State Board of Health	1884 to 1893
Thomas F. Wood, M.D., Secretary	Wilmington	State Society	1885 to 1887
William D. Hilliard, M.D.	Asheville	State Society	1885 to 1891
Arthur Winslow, Civil Engineer	Raleigh	Gov. A. M. Scales	1885 to 1891
W. G. Simmons, Chemist	Wake Forest	Gov. A. M. Scales	1885 to 1887
J. H. Tucker, M. D.	Henderson	Gov. A. M. Scales	1885 to 1887
R. H. Lewis, M.D., Secretary	Raleigh	State Society	1887 to 1893
H. T. Bahnson, M.D., President	Winston	State Society	1887 to 1888
Arthur Winslow, Civil Engineer	Raleigh	Gov. A. M. Scales	1887 to 1889
W. G. Simmons, Chemist	Wake Forest	Gov. A. M. Scales	1887 to 1889
J. H. Tucker, M.D.	Henderson	Gov. A. M. Scales	1888 to 1891
J. L. Ludlow, Civil Engineer	Winston	Gov. A. M. Scales	1888 to 1891
J. H. Tucker, M.D.	Henderson	Gov. D. G. Fowle	1888 to 1891
F. P. Venable, Ph.D., Chemist	Chapel Hill	Gov. D. G. Fowle	1888 to 1891
J. L. Ludlow, Civil Engineer	Winston	Gov. D. G. Fowle	1889 to 1893
J. A. Hodges, M.D.	Fayetteville	State Society	1889 to 1892
J. M. Baker, M.D.	Tarboro	State Society	1889 to 1893
J. H. Tucker, M.D.	Henderson	Gov. T. M. Holt	1891 to 1893
F. P. Venable, Ph.D., Chemist	Chapel Hill	Gov. T. M. Holt	1891 to 1893
J. L. Ludlow, Civil Engineer	Winston	Gov. T. M. Holt	1891 to 1892
Thomas F. Wood, M.D., Secretary	Wilmington	State Society	1891 to 1897
George G. Thomas, M.D., President	Wilmington	State Board of Health	1892 to 1897
S. Westray Battle, M.D.	Asheville	State Society	1891 to 1895
W. H. Harrell, M.D.	Williamston	State Society	1892 to 1895
John Whitehead, M.D.	Salisbury	State Board of Health	1893 to 1895
W. H. G. Lucas	White Hall	Gov. Elias Carr	1893 to 1895
F. P. Venable, Ph.D., Chemist	Chapel Hill	Gov. Elias Carr	1893 to 1895
John C. Chase, Civil Engineer	Wilmington	Gov. Elias Carr	1893 to 1895
R. H. Lewis, M.D., Secretary	Raleigh	Gov. Elias Carr	1893 to 1895
W. P. Beall, M.D.	Greensboro	Gov. Elias Carr	1894 to 1897
W. J. Lumsden, M.D.	Elizabeth City	Gov. Elias Carr	1895 to 1897
John Whitehead, M.D.	Salisbury	State Society	1895 to 1897
W. H. Harrell, M. D.	Williamston	State Society	1895 to 1897
W. P. Beall, M.D.	Greensboro	Gov. Elias Carr	1895 to 1897
R. H. Lewis, M.D., Secretary	Raleigh	Gov. Elias Carr	1895 to 1897
F. P. Venable, Ph.D., Chemist	Chapel Hill	Gov. Elias Carr	1895 to 1897
John C. Chase, Civil Engineer	Wilmington	Gov. Elias Carr	1897 to 1899
Charles J. O'Hagan, M.D.	Greenville	Gov. D. L. Russell	1897 to 1899
John D. Spicer, M.D.	Goldsboro	Gov. D. L. Russell	1897 to 1899
J. L. Nicholson, M.D.	Richlands	Gov. D. L. Russell	1897 to 1899
R. H. Lewis, M.D., Secretary	Raleigh	Gov. D. L. Russell	1897 to 1899
A. W. Shaffer, Civil Engineer	Raleigh	Gov. D. L. Russell	1899 to 1901
Charles J. O'Hagan, M.D.	Greenville	Gov. D. L. Russell	1899 to 1901
J. L. Nicholson, M.D.	Richlands	Gov. D. L. Russell	1899 to 1901
Albert Anderson, M.D.	Wilson	Gov. D. L. Russell	1899 to 1901
R. H. Lewis, M.D., Secretary	Raleigh	Gov. D. L. Russell	1899 to 1901

*Died in 1892, leaving a five-year unexpired term, which was filled by the Board.

MEMBERS STATE BOARD OF HEALTH—Continued

Name	Address	Appointed by	Term
George G. Thomas, M.D., President	Wilmington	State Society	1899 to 1901
S. Westray Battle, M.D.	Asheville	State Society	1899 to 1901
H. W. Lewis, M.D.	Jackson	State Society	1899 to 1901
H. H. Dodson, M.D.	Milton	State Society	1899 to 1901
R. H. Lewis, M.D., Secretary	Raleigh	Gov. C. B. Aycock	1901 to 1907
W. P. Ivey, M.D.	Lenoir	Gov. C. B. Aycock	1901 to 1907
George G. Thomas, M.D., President	Wilmington	Gov. C. B. Aycock	1901 to 1905
Francis Duffy, M.D.	New Bern	Gov. C. B. Aycock	1901 to 1905
J. L. Ludlow, Civil Engineer	Winston	Gov. C. B. Aycock	1901 to 1905
S. Westray Battle, M.D.	Asheville	State Society	1901 to 1907
H. W. Lewis, M.D.	Jackson	State Society	1901 to 1907
W. H. Whitehead, M.D.	Rocky Mount	State Society	1901 to 1905
J. L. Nicholson, M.D.	Richlands	State Society	1901 to 1905
J. L. Ludlow, Civil Engineer	Winston	Gov. C. B. Aycock	1903 to 1909
J. Howell Way, M.D.	Waynesville	Gov. R. B. Glenn	1905 to 1911
W. O. Spencer, M.D.	Winston	Gov. R. B. Glenn	1905 to 1911
George G. Thomas, M.D., President	Wilmington	State Society	1905 to 1911
Thomas E. Anderson, M.D.	Statesville	State Society	1905 to 1911
R. H. Lewis, M.D.	Raleigh	Gov. R. B. Glenn	1907 to 1913
E. C. Register, M.D.	Charlotte	Gov. R. B. Glenn	1907 to 1913
David T. Tayloe, M.D.	Washington	State Society	1907 to 1909
James A. Burroughs, M.D.[1]	Asheville	State Society	1907 to 1913
J. E. Ashcraft, M.D.	Monroe	State Board of Health	1909 to 1913
J. L. Ludlow, Civil Engineer	Winston-Salem	Gov. W. W. Kitchin	1909 to 1913
J. Howell Way, M.D., President	Waynesville	Gov. W. W. Kitchin	1911 to 1917
W. O. Spencer, M.D.	Winston-Salem	Gov. W. W. Kitchin	1911 to 1917
Thomas E. Anderson, M.D.	Statesville	State Society	1911 to 1917
Charles O'H. Laughinghouse, M.D.	Greenville	State Society	1911 to 1917
R. H. Lewis, M.D.	Raleigh	Gov. Locke Craig	1913 to 1919
Edw. J. Wood, M.D.	Wilmington	Gov. Locke Craig	1913 to 1919
A. A. Kent, M.D.[2]	Lenoir	State Society	1913 to 1915
Cyrus Thompson, M.D.	Jacksonville	State Society	1913 to 1919
Fletcher R. Harris, M.D.	Henderson	State Board of Health	1913 to 1919
J. L. Ludlow, Civil Engineer	Winston-Salem	Gov. Locke Craig	1915 to 1921
J. Howell Way, M.D., President	Waynesville	Gov. T. W. Bickett	1917 to 1923
E. C. Register, M.D.[1]	Charlotte	Gov. T. W. Bickett	1917 to 1923
Thomas E. Anderson, M.D.	Statesville	State Society	1917 to 1923
Charles O'H. Laughinghouse, M.D.	Greenville	State Society	1917 to 1923
Fletcher R. Harris, M.D.[3]	Henderson	State Society	1919 to 1923
A. J. Crowell, M. D.	Charlotte	Gov. T. W. Bickett	1919 to 1923
Chas. E. Waddell, C.E.[4]	Asheville	Gov. Cameron Morrison	1921 to 1923
Cyrus Thompson, M.D.	Jacksonville	State Society	1919 to 1925
R. H. Lewis, M.D.	Raleigh	Gov. T. W. Bickett	1919 to 1925
E. J. Tucker, D.D.S.	Roxboro	Gov. T. W. Bickett	1923 to 1925
J. Howell Way, M.D., President	Waynesville	Gov. Cameron Morrison	1923 to 1929
A. J. Crowell, M.D.	Charlotte	Gov. Cameron Morrison	1923 to 1929
James P. Stowe, Ph.G.	Charlotte	Gov. Cameron Morrison	1923 to 1927
D. A. Stanton, M.D.	High Point	State Board of Health	1923 to 1925
Thomas E. Anderson, M.D.	Statesville	State Society	1923 to 1929
Charles O'H. Laughinghouse, M.D.[5]	Greenville	State Society	1923 to 1926
Cyrus Thompson, M.D.	Jacksonville	State Society	1925 to 1931
D. A. Stanton, M.D.	High Point	State Society	1925 to 1931
R. H. Lewis, M. D.[1]	Raleigh	Gov. A. W. McLean	1925 to 1931
E. J. Tucker, D.D.S.	Roxboro	Gov. A. W. McLean	1925 to 1931
W. S. Rankin, M.D.	Charlotte	State Board of Health	1926 to 1929

[1]Died leaving unexpired term.
[2]Resigned to become member of General Assembly.
[3]Resigned to become Health Officer Vance County.
[4]Resigned.
[5]Resigned to become Secretary of State Board of Health.

STATE BOARD OF EXAMINERS FOR NURSES

Miss Mary P. Laxton, President	Biltmore
Mrs. Z. V. Conyers, Secretary and Treasurer	Greensboro
Miss E. A. Kelly	Fayetteville
Dr. Oren Moore (from State Medical Society)*	Charlotte
Dr. R. Duval Jones (from State Hospital Association)	New Bern

*Elected in 1925 to serve three years.

STATUS OF SOCIETY MEMBERSHIP BY COUNTIES FOR YEARS 1912-1926

County	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
Alamance-Caswell *a*	11	11	13	9	10	12	10	15	27	27	31	27	27	25	27
Alexander *b*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alleghany	.....	.....	.....	2	2	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Anson	6	8	7	.....	.....	.....	1	3	2	1	2	12	12	11	10
Ashe	.....	.....	.....	.....	.....	11	15	8	7	5	9	8	6	10	6
Avery	.....	.....	8	7	9	9	7	6	4	5	4	5	5	5	5
Beaufort	15	14	14	14	14	10	11	10	14	12	14	17	14	17	17
Bertie	2	13	3	3	3	3	5	5	10	9	12	10	9	9	8
Bladen	4	5	7	7	6	9	8	9	8	7	7	4	3	8	7
Brunswick	2	5	4	5	.....	.....	2	2	2	1	1	1	1	1	1
Buncombe	64	69	68	70	71	74	76	81	83	92	96	99	105	97	102
Burke	11	13	15	17	17	16	17	6	11	12	11	15	13	14	11
Cabarrus	21	19	22	23	25	20	22	19	20	19	21	23	19	21	21
Caldwell	10	12	12	11	7	9	13	12	10	10	12	12	10	11	14
Camden *c*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Carteret	7	6	7	7	9	7	4	7	9	9	8	12	10	10	12
Caswell *d*	1	1	1	1	1	1	1	3	2	2	1	1	1	2	.....
Catawba	.....	.....	.....	15	13	18	.....	5	18	16	22	20	19	16	16
Chatham	.....	14	15	12	11	11	11	7	10	11	6	7	9	9	7
Cherokee	9	8	7	10	9	11	10	6	10	10	10	10	9	10	9
Chowan-Perquimans	5	8	9	7	4	3	.....	6	8	7	6	7	8	5	9
Clay *e*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cleveland	15	15	16	13	13	16	16	17	19	16	19	18	18	17	19
Columbus	12	12	14	9	11	7	1	6	10	8	9	14	11	12	14
Craven	14	18	15	11	8	11	7	7	6	6	8	10	12	14	16
Cumberland	22	23	22	24	19	17	16	15	20	24	23	22	32	31	28
Currituck	4	4	6	7	6	6	1	5	5	5	5	4	4	4	4
Dare *f*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Davidson	15	13	17	13	9	20	20	19	18	16	18	18	22	20	19
Davie	6	.....	.....	.....	6	5	4	4	4	4	4	6	4	5	4
Duplin	8	9	7	4	7	10	9	9	10	12	11	12	12	13	13
Durham-Orange	31	32	38	40	41	44	35	33	45	40	43	43	47	53	60
Edgecombe	11	11	13	13	13	10	10	7	15	15	15	12	10	11	12
Forsyth	31	32	37	39	42	45	37	37	57	62	60	59	62	63	64
Franklin	11	10	10	12	11	10	11	11	12	10	12	12	12	12	12
Gaston	29	30	27	26	25	27	27	26	35	38	39	40	40	39	40
Gates	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	1	1	.....
Graham	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Granville	13	12	14	11	16	16	14	14	15	14	14	12	13	13	12
Greene	5	5	5	5	6	5	2	5	6	7	7	5	6	5	5
Guilford	58	59	62	71	66	68	67	72	77	78	80	87	93	107	112
Halifax	2	11	11	7	15	8	1	7	28	24	24	18	21	20	16
Harnett	17	17	16	17	15	17	15	14	16	15	16	15	15	13	12
Haywood	11	13	15	11	11	11	9	9	11	10	12	13	13	14	14
Henderson-Polk *g*	17	11	14	14	15	15	11	13	15	13	13	13	13	14	17
Hertford	.....	8	10	4	1	5	10	10	10	10	10	10	10	8	8
Hoke	.....	.....	.....	.....	.....	10	11	10	10	8	6	8	9	11	10
Hyde	6	7	7	.....	.....	.....	1	2	1	1	2	1	2	1	1
Iredell-Alexander	9	9	14	16	9	20	11	11	21	18	20	19	20	26	29
Jackson	.....	2	3	5	2	5	2	5	5	6	6	6	8	7	7
Johnston	18	18	19	21	19	22	16	24	22	23	26	25	25	24	28
Jones	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	1	4	4
Lee	.....	7	8	7	8	8	6	8	8	8	10	10	11	13	13
Lenoir	8	9	12	14	15	16	15	17	22	19	20	17	20	18	20
Lincoln	11	12	13	14	11	9	11	15	16	14	13	14	16	11	11
Macon-Clay	.....	4	4	5	5	4	6	6	6	7	7	7	7	6	8
Madison	10	7	8	11	9	10	.....	11	11	12	8	11	11	11	11
Martin	12	13	14	14	15	17	12	11	16	14	12	13	10	10	10
McDowell	6	6	7	7	7	8	7	6	6	5	5	6	7	8	7
Mecklenburg	50	63	69	71	74	63	49	97	104	107	110	115	109	121	117
Mitchell-Watauga	5	4	2	2	2	1	.....	4	5	8	10	10	7	7	8
Montgomery	7	8	6	10	9	9	8	6	8	11	10	9	9	8	9
Moore	21	13	16	15	18	10	15	16	16	17	21	20	20	19	21
Nash	1	.....	19	18	26	27	21	26	25	26	30	30	33	34	32
New Hanover	22	31	28	33	41	30	29	38	40	46	51	46	44	42	40
Northampton	1	12	12	11	10	14	11	13	10	11	11	10	10	10	11
Onslow	10	12	10	8	9	11	7	9	8	7	7	5	6	6	5
Orange *h*	1	8	.....	.....	.....	.....	.....	.....	.....	6	.....	.....	.....	.....	.....
Pamlico	4	5	5	5	5	5	4	4	5	6	5	5	4	5	5
Pasquotank-Camden-Dare	12	13	15	15	17	19	16	15	16	11	19	18	17	18	19
Pender	2	2	.....	.....	.....	.....	4	3	1	1	2	2	1	1	1
Perquimans *i*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Person	11	11	8	11	13	12	.....	12	10	11	10	10	10	8	7
Pitt	5	9	5	15	9	14	5	18	24	19	24	23	24	26	24
Polk *j*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
Randolph	9	7	12	14	11	13	11	12	13	15	14	14	13	14	12

STATUS OF MEMBERSHIP BY COUNTIES—(Continued)

County	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
Richmond	10	.....	10	13	13	14	11	13	12	14	13	14	16	19	18
Robeson	23	35	24	16	22	16	8	31	35	34	33	27	29	30	31
Rockingham	16	18	19	17	10	4	15	16	20	23	25	21	23	26	23
Rowan	24	23	26	22	25	23	22	24	28	31	32	32	36	40	40
Rutherford	18	19	20	19	21	14	17	18	20	12	18	22	21	21	22
Sampson	12	12	11	14	18	15	10	11	13	14	12	13	17	15	14
Scotland	9	11	12	12	12	13	10	9	10	12	12	12	12	12	12
Stanly	11	11	13	14	9	14	11	11	15	12	11	12	15	14	13
Stokes	11	7	12	13	12	10	5	5	10	6	12	9	10	10	5
Surry	14	19	21	19	18	23	24	27	28	25	25	24	26	22	17
Swain	.....	.....	.....	.....	.....	6	7	2	3	1	4	3	1	1	1
Translyvania	5	6	7	6	7	5	.....	1	1	1	5	6	4	8	4
Tyrrell *k*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union	16	17	16	16	12	13	15	14	16	17	17	18	18	19	19
Vance	11	11	10	11	13	10	4	5	11	11	10	10	12	11	12
Wake	54	41	53	57	62	70	56	81	68	73	76	85	73	78	79
Warren	5	5	5	8	7	7	6	3	8	8	7	7	6	6	6
Washington-Tyrrell	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	9	9	9	8	8
Watauga *l*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wayne	16	19	13	7	17	19	18	27	28	24	33	32	29	32	34
Wilkes	6	9	8	7	6	9	8	10	10	11	10	10	10	10	9
Wilson	17	17	24	22	22	24	21	25	29	31	28	31	31	32	34
Yadkin	6	7	7	6	.....	.....	.....	10	2	5	4	3	2	3	2
Yancey	.....	.....	.....	.....	.....	.....	.....	3	3	1	1	1	1	1	2
Totals	1036	1133	1220	1221	1228	1271	1087	1306	1497	1491	1571	1592	1606	1657	1666

a The figures for 1926 are for Alamance-Caswell; for the other years, for Alamance only; *b* See Iredell-Alexander; *c* See Pasquotank-Camden-Dare; *d* For 1926, see Alamance-Caswell; *e* See Macon-Clay; *f* See Pasquotank-Camden-Dare; *g* The figures for 1926 are for Henderson only; for the other years, for Henderson-Polk; *h* See Durham-Orange; *i* See Chowan-Perquimans; *j* See Henderson-Polk for 1912-1925; *k* See Washington-Tyrrell; *l* See Mitchell-Watauga.

HONORARY FELLOWS, MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA

Adams, M. R. ..... Statesville
Alexander, Annie L. ..... Charlotte
*Alston, B. P. ..... Epsom
Ambler, C. P. ..... Asheville
Anderson, Albert ..... Raleigh
Anderson, Thos. Eli ..... Statesville
*Archey, L. M. ..... Concord
*Asbury, F. E. ..... Asheboro
*Attmore, Geo. S. ..... Stonewall
*Bahnson, H. T. ..... Winston-Salem
Baker, J. M. ..... Tarboro
*Barrier, P. A. ..... Mt. Pleasant
Battle, J. T. J. ..... Greensboro
*Battle, Kemp P. ..... Raleigh
Battle, S. W. ..... Charlotte
Beall, Wm. P. ..... Greensboro
*Bellamy, W. J. H. ..... Wilmington
Boddie, N. P. ..... Durham
*Bolton, Mahlon ..... Rich Square
*Booth, Samuel D. ..... Oxford
Brown, J. S. ..... Hendersonville
Brownson, W. C. ..... Asheville
*Bulluck, D. W. ..... Wilmington
Bynum, John ..... Winston-Salem
*Caldwell, D. G. ..... Concord
*Cheatham, Archibald ..... Durham
*Clark, G. L. ..... Clarkton
Council, J. B. ..... Salisbury
*Covington, J. M. ..... Wadesboro
Cox, E. L. ..... Jacksonville
*Croom, J. D. ..... Maxton
Crowell, A. J. ..... Charlotte
Daligny, Charles ..... Troy
Dalton, David N. ..... Winston-Salem
DeArmon, J. McC. ..... Charlotte
*Denny, Wm. W. ..... Pink Hill
Dillard, Richard, Jr. ..... Edenton
Dodson, H. H. ..... Greensboro
*Duffy, Charles ..... New Bern
*Duffy, Francis ..... New Bern
Edgerton, Jas. L. ..... Hendersonville
*Edwards, G. C. ..... Hookerton
Edwards, J. D. ..... Siler City
Ellis, R. C. ..... Shelby
*Faison, I. W. ..... Charlotte
Faison, Wm. W. ..... Goldsboro
*Fletcher, M. H. ..... Asheville
*Fox, M. F. ..... Guilford College
*Freeman, Richard A. ..... Burlington
Galloway, W. C. ..... Wilmington
Gibbon, Robert L. ..... Charlotte
Gilmer, Chas. S. ..... Greensboro, R. 6
Goley, Wm. R. ..... Graham
*Goodman, E. G. ..... Lanvale
Goodwin, A. W. ..... Raleigh
Cove, Anna M. ..... Greensboro
James C. Grady ..... Kenly
*Graham, Joseph ..... Charlotte
Graham, Wm. A. ..... Charlotte
*Griffin, J. A. ..... Clayton
*Hall, Wright ..... Wilmington
Halsey, B. F. ..... Roper
*Hargrove, R. H. ..... Robersonville
Harris, F. R. ..... Henderson
*Harris, I. A. ..... Weaverville
Harriss, A. H. ..... Wilmington
Hays, Benj. K. ..... Fort Lyon, Colo. (Granville Co.)
*Haywood, F. J. ..... Raleigh
Haywood, Hubert, Sr. ..... Raleigh
*Hicks, Wm. N. ..... Durham
Highsmith, J. F. ..... Fayetteville
*Hill, L. H. ..... Germanton
Houck, Albert F. ..... Lenoir
*Hudson, Wm. L. ..... Dunn
*Hughes, Francis W. ..... New Bern
Hunter, L. W. ..... Charlotte
Ingram, Chas. B. ..... Mt. Gilead
Irwin, J. R. ..... Charlotte
Jenkins, Chas. L. ..... Raleigh
Jewett, Robert D. ..... Wilmington
Johnson, N. M. ..... Durham
Jones, A. G. ..... Walnut Cove
Jordan, T. M. ..... Raleigh
Julian, Charles A. ..... Thomasville
*Knight, J. B. H. ..... Williamston
Knox, A. W. ..... Raleigh
Laughinghouse, Chas. O'H., Greenville
*Leggett, Kenelm ..... Hobgood
Lewis, Geo. W. ..... Wilson
Lewis, H. W. ..... Jackson
Lewis, R. H. ..... Raleigh
Linville, A. Y. ..... Winston-Salem
*Long, Benj. L. ..... Hamilton

*Deceased.

*Long, Geo. W. ..... Graham
Long, H. F. ..... Statesville
Long, J. W. ..... Greensboro
*Love, W. J. ..... Wilmington
*McDonald, A. D. ..... Wilmington
McGeachy, R. S. ..... Kinston
McGee, J. W. ..... Raleigh
*McKay, A. M. ..... Summerville
*McKay, John A. ..... Buies Creek
*McKee, James ..... Raleigh
McKenzie, W. W. ..... Salisbury
McLaughlin, J. E. ..... Statesville
McMillan, Benj. F. ..... Red Springs
*McMillan, J. D. ..... Lumberton
*McMillan, J. L. ..... Red Springs
McMillan, W. D. ..... Wilmington
McNeill, J. W. ..... Fayetteville
*McNeill, Wm. M. ..... Buies Creek
Manning, J. M. ..... Durham
*Miller, J. F. ..... Goldsboro
Misenheimer, C. A. ..... Charlotte
*Misenheimer, Theo. F. ..... Morven
*Monroe, W. A. ..... Sanford
Montgomery, John C. ..... Charlotte
Moore, C. E. ..... Wilson
Moore, Edwin G. ..... Elm City
Munroe, J. P. ..... Charlotte
Nelson, R. J. ..... Robersonville
*Nicholson, J. L. ..... Richland
Nicholson, P. A. ..... Washington
Nicholson, Sam T. ..... Washington
Noble, R. J. ..... Selma
Parrott, J. M. ..... Kinston
*Pate, Wm. T. ..... Gibson
Pemberton, Wm. D. ..... Concord
*Perry, M. P. ..... Macon
*Pharr, T. F. ..... Concord
*Pharr, Wm. W. ..... Charlotte
*Phillips, Matthew D. ..... Dalton
*Picot, L. J. ..... Littleton
Pressly, G. W. ..... Charlotte
*Prince, D. M. ..... Laurinburg
*Register, Edw. C. ..... Charlotte
Reynolds, C. V. ..... Asheville
*Ritter, F. W. ..... Moyock
Rodman, J. C. ..... Washington
Royster, H. A. ..... Raleigh
Royster, W. I. ..... Raleigh
Sawyer, C. J. ..... Windsor
Schonwald, J. T. ..... Wilmington
*Shaffner, J. F., Sr. ..... Winston-Salem
Shamburger, J. B. ..... Star
Sikes, G. T. ..... Creedmoor
Smith, J. B. ..... Pilot Mountain
Smith, R. A. ..... Goldsboro
Snipes, E. P. ..... Jonesboro
*Speight, R. H., Sr. ..... Whitakers
Spencer, W. O. ..... Winston-Salem
Stamps, Thos. ..... Lumber Bridge
Stanton, D. A. ..... High Point
*Stevens, J. A. ..... Clinton
Stevens, M. L. ..... Asheville
Strickland, Edw. F. ..... Winston-Salem
Summerell, E. M. ..... China Grove
Summers, Chas. L. ..... Baltimore, Md.
(Forsyth Co.)
Tayloe, D. T., Sr. ..... Washington
*Taylor, I. M. ..... Morganton
*Thomas, G. G. ..... Wilmington
Trantham, H. T. ..... Salisbury
*Tull, Henry ..... Kinston
Van Poole, C. M. ..... Salisbury
Vestal, W. J. ..... Lexington
*Von Ruck, Karl ..... Asheville
Ward, W. H. ..... Plymouth
Way, J. Howell ..... Waynesville
Weaver, H. B. ..... Asheville
Wharton, L. D. ..... Smithfield
*Whitaker, R. A. ..... Kinston
White, J. W. ..... Wilkesboro
*Whitehead, John ..... Salisbury
*Whitehead, W. H. ..... Rocky Mount
Whitfield, Wm. Cobb ..... Grifton
Whittington, W. P. ..... Asheville
*Williams, J. H. ..... Asheville
Wilson, A. R. ..... Greensboro
*Young, R. S. ..... Concord

*Deceased.
(NOTE: Members having paid dues for thirty years become Honorary Fellows.)

HONORARY MEMBERS, MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA

*L. McL. Tiffany	Baltimore, Md.
W. W. Keen	Philadelphia, Pa.
J. Allison Hodges	Richmond, Va.
*R. L. Payne	Norfolk, Va.
*J. N. McCormack	Bowling Green, Ky.
R. L. Payne, Jr.	Norfolk, Va.
J. L. Ludlow, C. E.	Winston-Salem
Paul V. Anderson	Richmond, Va.
Stuart McGuire	Richmond, Va.
William J. Mayo	Rochester, Minn.
William Seaman Bainbridge	New York, N. Y.
William Sharpe	New York, N. Y.
William McKim Marriott (Elected 1925)	St. Louis, Mo.

*Deceased.

OFFICERS, 1925-1926

President—Dr. Wm. deB. MacNider	Chapel Hill
First Vice-President—Dr. J. P. Matheson	Charlotte
Second Vice-President—Dr. W. W. Dawson	Grifton
Third Vice-President—Dr. K. G. Averitt	Cedar Creek
Secretary-Treasurer (1924-1927)—Dr. L. B. McBrayer†	Southern Pines

OFFICERS, 1926-1927

President—Dr. John Q. Myers	Charlotte
First Vice-President—Dr. J. W. Carroll	Wallace
Second Vice-President—Dr. A. Y. Linville	Winston-Salem
Third Vice-President—Dr. C. H. Cocke	Asheville
Secretary-Treasurer (1924-1927)—Dr. L. B. McBrayer†	Southern Pines

COUNCILORS, 1925-1928

First District—Dr. H. D. Walker	Elizabeth City
Second District—Dr. Grady G. Dixon	Ayden
Third District—Dr. E. J. Wood	Wilmington
Fourth District—Dr. J. C. Grady	Kenly
Fifth District—Dr. J. D. Highsmith	Fayetteville
Sixth District—Dr. V. M. Hicks	Raleigh
Seventh District—Dr. T. C. Bost	Charlotte
Eighth District—Dr. F. R. Taylor	High Point
Ninth District—Dr. M. R. Adams	Statesville
Tenth District—Dr. W. J. Hunnicutt	Asheville

CHAIRMEN OF SECTIONS, 1927

Practice of Medicine—Dr. W. D. Rodgers	Warrenton
Surgery—Dr. A. DeTalma Valk	Winston-Salem
Pediatrics—Dr. Spencer P. Bass	Tarboro
Eye, Ear, Nose, and Throat—Dr. John B. Wright	Raleigh
Medical Veterans of the World War and Medical Officers' Reserve Corps—Dr. C. S. Lawrence	Winston-Salem

†Again elected in 1925, although term had not expired.

Chemistry, Materia Medica, and Therapeutics—Dr. Ben H. Hackney.....Lucama
Gynecology and Obstetrics—Dr. C. S. Grayson.....High Point
Public Health and Education—Dr. F. M. Davis.....Canton

DELEGATES

To American Medical Association

Dr. W. D. James, 1926-1927.....Hamlet
Dr. M. L. Stevens, 1926-1927.....Asheville
Dr. J. G. Murphy, 1927-1928.....Wilmington

Alternates

Dr. A. J. Crowell.....Charlotte
Dr. G. H. Macon.....Warrenton
Dr. E. S. Boice.....Rocky Mount

To Medical Society of Virginia

Dr. D. T. Tayloe, Jr.....Washington
Dr. C. A. Woodard.....Wilson
Dr. John Wesley Long*.....Greensboro
Dr. W. J. Hunnicutt.....Asheville

To South Carolina Medical Association

Dr. Charles I. Allen.....Wadesboro
Dr. J. F. Abel.....Waynesville
Dr. E. L. Bowman.....McDonalds
Dr. W. E. Warren.....Williamston

COMMITTEES

Scientific Work

(Appointed in 1922 to serve for five years)

Dr. J. B. Bullitt.....Chapel Hill
Dr. C. A. Shore.....Raleigh
Dr. E. J. Wood.....Wilmington

Public Policy and Legislation

Dr. John B. Wright, *Chairman*.....Raleigh
Dr. A. A. Kent.....Lenoir
Dr. K. P. B. Bonner.....Morehead City

Finance

Dr. C. W. McPherson, *Chairman*.....Burlington
Dr. E. A. Lockett.....Winston-Salem
Dr. R. S. Beam.....Lumberton

Obituaries

Dr. E. G. Moore, *Chairman*.....Elm City
Dr. H. A. Royster.....Raleigh
Dr. C. M. Van Poole.....Salisbury

Memorial for the North Carolina Physicians Who Died in the World War

Dr. J. P. Munroe, *Chairman*.....Charlotte
Dr. A. J. Crowell.....Charlotte

*Deceased.

DR. L. B. MCBRAYER ..... Southern Pines
DR. J. M. PARROTT ..... Kinston
DR. J. T. BURRUS ..... High Point

Glascock-Wake County Controversy

DR. J. M. PARROTT, *Chairman* ..... Kinston
DR. J. G. MURPHY ..... Wilmington
DR. FOY ROBERSON ..... Durham
DR. JOHN WESLEY LONG* ..... Greensboro
DR. A. J. CROWELL ..... Charlotte

Public Health Administration†

PRES. STATE BOARD OF HEALTH, *ex-officio* ..... Dr. J. Howell Way, Chm., Waynesville
PRES. STATE BOARD OF MEDICAL EXAMINERS, *ex-officio* ..... Dr. W. W. Dawson, Grifton
PRES. NORTH CAROLINA HOSPITAL ASSO., *ex-officio* ..... Dr. J. R. Alexander, Charlotte

Tonsil-Adenoid Clinics

DR. V. M. HICKS, *Chairman* ..... Raleigh
DR. J. P. MATHESON ..... Charlotte
DR. R. L. DANIELS ..... New Bern

Package Libraries for Physicians

(Appointed in 1925 to serve two years)

DR. FOY ROBERSON ..... Durham
DR. J. HOWELL WAY ..... Waynesville
DR. WM. DEB. MACNIDER ..... Chapel Hill

Proposed Amendment to By-Laws[1]

DR. J. M. PARROTT, *Chairman* ..... Kinston
DR. C. O'H. LAUGHINGHOUSE ..... Greenville
DR. CYRUS THOMPSON ..... Jacksonville

Award of Moore County Medical Society Medal[2]

DR. W. C. MUDGETT, *Chairman* ..... Southern Pines
DR. WILLIAM ALLAN ..... Charlotte
DR. JOHN WESLEY LONG* ..... Greensboro

Periodical Medical Examinations of the Apparent Healthy[3]

DR. H. L. BROCKMANN, *Chairman* ..... High Point
DR. PARKS M. KING ..... Charlotte
DR. P. P. MCCAIN ..... Sanatorium

Centralization of State Institutions[4]

DR. ROBERT L. FELTS, *Chairman* ..... Durham
DR. C. A. WOODARD ..... Wilson
DR. E. J. WOOD ..... Wilmington
DR. FOY ROBERSON ..... Durham

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*Deceased.
†Continuing committee.
[1]See page 92.
[2]See page 86.
[3]See page 182.
[4]See President's Address, page 12.

DR. P. P. MCCAIN ..... Sanatorium
DR. OSCAR L. MILLER ..... Gastonia
DR. W. H. DIXON ..... Kinston

Public Health Training for Public Health Officers[1]

DR. G. M. COOPER, *Chairman* ..... Raleigh
DR. S. E. BUCHANAN ..... Concord
DR. R. S. MCGEACHY ..... Kinston

Journal and Whole-Time Secretary[1]

DR. H. A. ROYSTER, *Chairman* ..... Raleigh
DR. J. M. NORTHINGTON ..... Charlotte
DR. L. B. MCBRAYER ..... Southern Pines
DR. WILLIAM ALLAN ..... Charlotte
DR. PAUL H. RINGER ..... Asheville

Harrison Narcotic Act[1]

DR. W. P. HOLT, *Chairman* ..... Duke
DR. ALBERT ANDERSON ..... Raleigh
DR. WILLIAM M. COPPRIDGE ..... Durham
DR. THOMAS M. PARROTT ..... Kinston
DR. J. Q. MYERS ..... Charlotte

Arrangements

DR. W. M. COPPRIDGE, *Chairman* ..... Durham

PLACE OF MEETING, 1927 ..... Durham
TIME OF MEETING, 1927 ..... Third Tuesday in April

[1]See President's Address, page 12.

PROGRAM

GENERAL SESSIONS

First Session.—Opening Exercises. Tuesday morning, June 15, at 8:30 o'clock, Convention Room, Oceanic Hotel, Dr. J. G. Murphy, Chairman of the Committee on Arrangements, presiding.

Address of Welcome: Dr. Edward Jenner Wood, Wilmington.

Response: Dr. Paul H. Ringer, Asheville.

President's Address: Dr. Wm. deB. MacNider, Chapel Hill.

Announcements.

Second Session—Tuesday evening, June 15, 8:30 o'clock, Convention Room, Oceanic Hotel.

The Use of Digitalis in Heart Disease: Dr. G. Canby Robinson, Dean of the Medical School of Vanderbilt University, Nashville, Tenn.

The Curve of Phthalein Excretion: Its Interpretation and Clinical Use: Dr. A. J. Crowell, Charlotte, President Tri-State Medical Society.

Stomach Trouble: Dr. J. Shelton Horsley, Richmond, Va.

Third Session—Wednesday morning, June 16, at 11:30 o'clock, Convention Room, Oceanic Hotel.

For the purpose of nominating members of the State Board of Medical Examiners.

Fourth Session—Wednesday afternoon, June 16, at 2:00 o'clock, Convention Room, Oceanic Hotel.

For the purpose of electing members of the State Board of Medical Examiners.

Fifth Session—Wednesday evening, June 16, at 8:30 o'clock, Convention Room, Oceanic Hotel. Final Business.

Conjoint Session of the Medical Society of the State of North Carolina and the North Carolina State Board of Health. Wednesday, June 16, at noon, in the Convention Room, Oceanic Hotel. Dr. J. Howell Way, President of the State Board of Health, presiding.

HOUSE OF DELEGATES

Monday evening, June 14, 8 o'clock, Convention Room, Oceanic Hotel.
Wednesday evening, June 16, 8 o'clock, Convention Room, Oceanic Hotel.

SECTION MEETINGS

SECTION ON PEDIATRICS

TUESDAY, JUNE 15, 10:00 A. M.

OCEAN FRONT ROTUNDA, OCEANIC HOTEL

Dr. John LaBruce Ward, Chairman, Asheville.

1. Chairman's Address: Dr. John LaBruce Ward, Asheville.

2. The Diabetic Child: Dr. Baird U. Brooks, Durham. Discussion opened by Dr. John R. Ashe, Charlotte.

3. Congenital Urinary Obstructions: Dr. Wm. M. Coppridge, Durham. Discussion opened by Dr. Hamilton W. McKay, Charlotte.

4. Roseola Infantum: Dr. Samuel F. Ravenel, Greensboro. Discussion opened by Dr. A. S. Root, Raleigh.

5. Etiology, Prevention, and Serum Treatment of Scarlet Fever: Dr. J. Buren Sidbury, Wilmington. Discussion opened by Dr. C. R. Bugg, Raleigh.

6. Certain Phases of Upper Respiratory Infections in Childhood: Dr. J. C. Knox, University of Iowa. Discussion opened by Dr. J. Buren Sidbury, Wilmington.

7. Alpha-lobelin as a Respiratory Stimulant: Dr. C. P. Mangum, Kinston. Discussion opened by Dr. A. McR. Crouch, Wilmington.

8. The Practical Application of Recent Advances in Pediatrics. Dr. Marion Y. Keith, Children's Hospital, St. Louis, Mo. Discussion opened by Dr. J. Buren Sidbury, Wilmington.

9. Some Observations on Enlarged Thymus: Dr. W. C. Verdery, Fayetteville. Discussion opened by Dr. R. H. Lafferty, Charlotte.

CLINIC FOR PEDIATRICS SECTION

TUESDAY, JUNE 15, 2:00 P. M.

BABIES' HOSPITAL, WRIGHTSVILLE SOUND

1. Demonstration of Skin Tests: (1) Schick Test; (2) Dick Test; (3) Tuberculin Tests: (a) Von Pirquet; (b) Intradermal; (4) Toxin-antitoxin Administration; (5) Scarlet Toxin Administration. Dr. J. C. Knox, University of Iowa.

2. Protein Sensitization Test: Dr. D. R. Murchison, Wilmington.

3. Persistent Thymus—Demonstration of Cases with X-ray Findings: Dr. J. Buren Sidbury, Wilmington.

4. Demonstration of Artificial Feeding Cases; (a) Complicated, (b) Uncomplicated: Dr. T. M. Watson, Wilmington.

5. Hookworm in Childhood—Demonstration of Cases with Laboratory Findings: Dr. T. M. Watson, Wilmington.

6. Demonstration of the Use of Ultra-violet Rays in the Treatment of Rickets and Malnutrition: Dr. J. C. Knox, University of Iowa.

7. Transfusion—Demonstration by Unger or Direct Method: Dr. J. Buren Sidbury, Wilmington.

SECTION ON SURGERY

TUESDAY, APRIL 15, 10:00 A. M. AND 2:00 P. M.

CONVENTION ROOM, OCEANIC HOTEL

Dr. Foy Roberson, Chairman, Durham.

1. Progress in Thoracic Surgery: Dr. George L. Carrington, Durham.

2. Local Anesthesia and the Reduction of Mortality in Surgery: Dr. James W. Davis, Statesville.

3. Ventriculography and Ventricular Estimation (Lantern Slides): Dr. Addison G. Brenizer, Charlotte.

4. Analysis of 100 Surgical Cases under Spinal Anesthesia: Dr. J. T. Burrus, High Point.

5. Appendicitis, the Crescendo of Treatment: Dr. J. Wesley Long, Greensboro.

6. Treatment of Fractures of the Hip (Lantern Slides): Dr. O. L. Miller, Charlotte.

7. Splenectomy in Hemorrhagic Purpura and Hemolytic Icterus, with Case Reports: Dr. A. deT. Valk, Winston-Salem.

8. Acidosis as a Cause of Acute Abdominal Pain: Dr. Douglas P. Murphy, Rutherfordton.

9. Carcinoma of the Breast, with Special Reference to Treatment by Surgery, X-ray, and Radium. Report of Cases: Dr. H. H. Bass, Philadelphia.

10. Management of the Malignant Prostrate as Constrasted with Benign Hypertrophy: Drs. Raymond Thompson and L. C. Todd, Charlotte.

11. Surgery of the Genito-urinary Tract in Pediatrics: Dr. Hamilton W. McKay, Charlotte.

12. Cervicitis, Endocervicitis, and Leukorrhea: Dr. Robert T. Ferguson, Charlotte.

13. Surgery of Fascia and Muscles in the Cure of Hernia, Based on Clinical and Experimental Evidence (Lantern Slides): Dr. Thomas C. Bost, Charlotte. Discussion opened by Drs. J. W. Gibbon and Oren Moore, Charlotte.

14. Jaundice: Dr. D. B. Cobb, Goldsboro.

15. Unusual Orthopedic Conditions, and Presentation of Clinical Cases, Dr. Alonzo Myers, Charlotte.

SECTION ON EYE, EAR, NOSE, AND THROAT

TUESDAY, JUNE 15, 10:00 AND 2:00 P. M.

PRIVATE DINING ROOM, SEASHORE HOTEL

Dr. O. C. Daniels, Chairman, Oriental.

Dr. V. M. Hicks, Secretary, Raleigh.

1. Chairman's Address: Dr. O. C. Daniels, Oriental.

2. Some of the Unusual Types of Corneal Ulcer: Dr. A. C. Banner, Greensboro.

3. Ether in Corneal Ulcers: Dr. Michael M. Saliba, Wilson.

4. Ocular Paralysis in Chronic Polioencephalitis Superior; Report of Case: Dr. S. R. Taylor, Greensboro.

5. Marked Unilateral Impairment of Vision Due to an Unusual Extra-ocular Cause: Dr. J. G. Johnston, Charlotte.

6. Acute Ear Conditions in Children: Dr. E. B. Quillen, Rocky Mount.

7. Paralysis of the Sixth Cranial Nerve, Complicating Mastoiditis; Two Case Reports: Dr. R. S. Beam, Lumberton.

8. Control of Hemorrhage in Tonsil Surgery: Dr. Casper W. Jennings, Greensboro.

9. Control of Hemorrhage Following Tonsillectomy: Dr. W. P. Speas, Hickory.

10. Some Considerations on Common Colds: Dr. A. J. Ellington, Burlington.

11. Treatment of Acute Nasal Sinusitis: Dr. L. N. West, Raleigh.

12. Sinus Trouble in Infants and Children: Dr. M. S. Broun, Asheville.

13. The Maxillary Sinus—Frequency of Infection and Treatment: Dr. T. B. Henderson, Goldsboro.

14. Chronic Antrum Trouble: Dr. J. G. Murphy, Wilmington.

SECTION ON PUBLIC HEALTH AND EDUCATION

TUESDAY, JUNE 15, 2:00 P.M.

OCEAN FRONT ROTUNDA, OCEANIC HOTEL

Dr. R. L. Carlton, Chairman, Winston-Salem.

1. Chairman's Address—The Health Department: Dr. R. L. Carlton, City Health Officer, Winston-Salem.

2. Medical Supervison of Public Schools: Dr. Chas. T. Nesbitt, Wilmington.

3. Experiences, Observations, and Views of a Prison Physician: Dr. L. Jack Smith, Health Officer, Wilson.

4. The Breast-feeding Demonstration and the County Medical Society: Dr. Frank Howard Richardson, New York City and Black Mountain.

5. The Vitamin Hypothesis and Its Significance: Dr. I. H. Manning, Dean, University of North Carolina Medical Department, Chapel Hill.

6. A Brief Review of Sera and Vaccines: Dr. C. A. Shore, Director State Laboratory of Hygiene, Raleigh.

7. The Tuberculosis Clinic: Dr. J. Donnelly, Chief of Clinics and Superintendent Mecklenburg County Sanatorium, Charlotte.

8. Medicine and Public Health: Dr. Thurman D. Kitchin, Dean, Medical Department of Wake Forest College, Wake Forest.

SECTION ON PRACTICE OF MEDICINE

WEDNESDAY, JUNE 16, 8:30 A. M. AND 2:20 P. M.

CONVENTION ROOM, OCEANIC HOTEL

Dr. M. L. Stevens, Chairman, Asheville.

1. Periodic Medical Examinations: Dr. Harry L. Brockmann, High Point. Discussion opened by Dr. W. S. Rankin, Charlotte.

2. A Consideration of Chronic Diarrhea: Dr. Paul F. Whitaker, Kinston. Discussion opened by Dr. Edward J. Wood, Wilmington.

3. Increasing Importance of Surgery in Tuberculosis: Dr. Paul H. Ringer, Asheville.

4. Diagnosis of Incipient Pulmonary Tuberculosis: Dr. O. Edwin Finch, Raleigh.

5. Care of the Tuberculosis Patient After Leaving the Sanatorium: Dr. J. W. Dickie, Southern Pines.

Discussion of the above three papers on tuberculosis by Dr. P. P. McCain, Sanatorium.

6. The Relation of Yeast to Pernicious Anemia: Dr. Edward J. Wood, Wilmington. Discussion opened by Dr. Harvey P. Barret, Charlotte.

7. Circular Insanity: Dr. James W. Vernon, Morganton. Discussion opened by Dr. Albert Anderson, Raleigh.

8. Suggestive Therapeutics: Dr. E. P. Mallet, Hendersonville. Discussion opened by Dr. L. G. Beall, Black Mountain.

9. Allergic Eczema and Urticaria: Dr. Reuben McBrayer, Shelby. Discussion opened by Dr. Fred M. Hanes, Winston-Salem.

10. Purpura: Dr. Carlyle Morris, Maxton. Discussion opened by Dr. Calvert R. Toy, Chapel Hill.

11. Observations on Peptic Ulcer (Lantern Slides): Dr. W. O. Nisbet, Charlotte. Discussion opened by Drs. R. L. Gibbon and R. H. Lafferty, Charlotte.

12. The Conduction System of the Heart (Lantern Slides): Dr. H. Thompson Frazer, Asheville.

13. Some Aspects of Cardiology: Dr. R. F. Leinbach, Charlotte.

14. Digitalis and Its Uses in Certain Cardiac Arhythmias: Dr. W. R. Stanford, Durham.

Discussion of the above three papers opened by Dr. J. P. Munroe, Charlotte.

15. Organotherapy: Dr. Owen Smith, High Point. Discussion opened by Dr. Harry L. Brockmann, High Point.

16. The Role of Iodin in Goiter: Dr. W. H. Sprunt, Jr., Winston-Salem.

17. The Use of Iodin in Goiter: Dr. W. B. Dewar, Raleigh.

Discussion of the above two papers on goiter by Dr. Addison G. Brenizer, Charlotte.

18. A Plea for Better Bedside Sanitation: Dr. W. D. Rodgers, Jr., Warrenton. Discussion opened by Dr. N. C. Daniel, Oxford.

19. Care and Treatment of Typhoid: Dr. C. G. Ferebee, Morehead City.

20. The Early Recognition of General Paralysis; Observation of Malarial Treatment: Dr. A. A. Barron, Charlotte. Discussion opened by Dr. John McCampbell, Morganton.

21. High Blood Pressure: Dr. Verne S. Caviness, Raleigh.

SECTION OF MEDICAL VETERANS OF THE WORLD WAR AND MEDICAL OFFICERS' RESERVE CORPS

WEDNESDAY, JUNE 16, 8:30 A. M.

BREAKFAST ROOM, OCEANIC HOTEL

Dr. J. W. MacConnell, Chairman, Davidson.

1. Chairman's Address—What Modern Medicine Owes to the Military Surgeon: Dr. J. W. MacConnell, Davidson.

2. Medical Service in the Spanish-American War: Dr. E. C. Boyette, Charlotte.

3. Chemical Warfare: Major Robert H. Hill, M. C., U. S. Army, Washington, D. C.

4. After-effects of War Gases: Dr. Robert W. Brace, Oteen.

5. So-called Shell Shock in Civil Life: Dr. Reuben McBrayer, Shelby.

6. Medical Reserve Officers' Camps: Dr. H. A. Newell, Henderson.

SECTION ON CHEMISTRY, MATERIA MEDICA, AND THERAPEUTICS

WEDNESDAY, JUNE 16, 8:30 A. M.

OCEAN FRONT ROTUNDA, OCEANIC HOTEL

Dr. G. H. Macon, Chairman, Warrenton.

1. The Value of Veratrum in Certain Hypertension Cases: Dr. Wm. deB. MacNider, Chapel Hill.

2. A Theoretical Significance of Excessive Indicanuria in Certain Types of Urticaria: Dr. C. T. Smith, Rocky Mount.

3. Hexylresorcinol in the Treatment of Pyelitis: Dr. L. H. Justis, Littleton.

4. Hyperthyroid Diagnosis and Treatment: Dr. J. Grover Raby, Tarboro.

5. The Role of Intravenous Glucose Solution as a Therapeutic Agent: Dr. J. S. Brewer, Roseboro.

6. The Systemic and Local Treatment of Extensive Superficial Burns: Dr. George L. Carrington, Durham.

7. The Salicylate Treatment of Acute Articular Rheumatism: Dr. Carl P. Parker, Seaboard.

8. Treatment of Pneumonia: Dr. W. Houston Moore, Wilmington.

9. The Inoculation with Tertian Malaria of Patients with Tabes Dorsalis: Dr. Hubert B. Haywood, Jr., Raleigh.

10. The Pneumonia Problem at the University of North Carolina: Dr. Eric A. Abernethy, Chapel Hill.

SECTION ON CHEMISTRY, MATERIA MEDICA, AND THERAPEUTICS

WEDNESDAY, JUNE 16, 8:30 A. M.

PRIVATE DINING ROOM, SEASHORE HOTEL

Dr. George H. Ross, Chairman, Durham.

1. Chairman's Address—Can We Improve on Nature in Obstetrics; When and How?: Dr. George H. Ross, Durham. Discussion opened by Dr. R. E. Brooks, Burlington.

2. The Vagina—the Surgical Opportunity: Dr. Oren Moore, Charlotte. Discussion opened by Drs. R. L. Gibbon and T. C. Bost, Charlotte.

3. Cranial Stress During Labor and Its Relation to Intracranial Birth Injuries: Dr. J. S. Brewer, Roseboro. Discussion opened by Dr. J. B. Sidbury, Wilmington.

4. Some Dangerous Complications of Labor: Dr. R. A. White, Asheville. Discussion opened by Dr. Ivan Procter, Raleigh.

5. The Circumcision of the New-born: Dr. J. B. Cranmer, Wilmington. Discussion opened by Dr. George L. Carrington, Durham.

6. Further Observations on the Prevention of Eclampsia: Dr. Ivan Procter, Raleigh. Discussion opened by Dr. Wm. deB. MacNider, Chapel Hill.

7. Indications for Surgical Delivery in Full-term and Near Full-term Pregnancies: Dr. R. B. Davis, Greensboro. Discussion opened by Dr. Oren Moore, Charlotte.

8. The Possibilities of the Potter Version: Dr. R. A. Ross, Durham. Discussion opened by Dr. C. D. Cater, Greensboro.

9. Uterine Hemorrhage: Dr. R. B. McMillan, Red Springs. Discussion opened by Dr. R. L. Pittman, Fayetteville.

10. Selecting the Method of Treatment of Uterine Fibromyomas—Myomectomy, Hysterectomy, Radium, and Deep X-ray Therapy: Drs. W. D. and A. W. James, Hamlet. Discussion opened by Dr. J. Wesley Long, Greensboro.

11. A Study of Five Hundred Consecutive Obstetric Cases: Dr. C. S. Grayson, High Point.

TRANSACTIONS

OF THE

SEVENTY-THIRD ANNUAL SESSION

OF THE

MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA

GENERAL SESSIONS

OPENING EXERCISES (FIRST GENERAL SESSION) TUESDAY MORNING, JUNE 15, 1926.

The Medical Society of the State of North Carolina met in the convention hall of the Oceanic Hotel, Wrightsville Beach, at nine o'clock, and was called to order by Dr. J. G. Murphy, of Wilmington, Chairman of the Committee on Arrangements.

ADDRESS OF WELCOME

EDWARD JENNER WOOD, M.D., Wilmington

Mr. Chairman, Ladies and Gentlemen, Fellow Members of the Medical Society of the State of North Carolina:

Representing the New Hanover County Medical Society, on their behalf and on behalf of the people of Wrightsville Beach and Wilmington, I welcome you most heartily to the seventh session of this Society held within our midst. So far as the available records show, the first meeting of this Society in New Hanover County was held in 1852, with Dr. J. E. Williamson presiding and Dr. E. Burke Haywood acting as secretary. The next session to be held in Wilmington was in 1870, with the distinguished and much beloved Dr. Charles J. O'Hagan as president. Ten years later, in 1880, Wilmington was again honored, and Dr. J. F. Shaffner, of Salem, presided. In 1892 the Society again met in Wilmington, with Dr. W. T. Cheatham in the chair. The first session to be held on Wrightsville Beach was in 1902, and Dr. Robert S. Young was president at the time. In 1910 we met in this same room, but during the year the president, Dr. J. A. Burroughs of Asheville, had died, and the vice-presidents presided.

The older members, especially, returning here will note the absence of a number of faces of the Wilmington medical profession, and to some it will be hard to realize a session in Wilmington without them. Sixteen years ago, when we met here, you were greeted by Dr. W. J. H. Bellamy, by Dr. Thomas S. Burbank, by Dr. William J. Love, by Dr. F. H. Rus-

sell and by Dr. George G. Thomas, all of whom have passed on, but they have left behind golden memories. In recent years Dr. Thomas had been more active than some of the others, and he will be remembered by a larger number. His death was a great loss to this Society, for his interest and activities in it extended over many years, and his services were of a high order. He had been president, president of the Board of Medical Examiners, and president of the State Board of Health for many years during a period of great activity. Dr. Bellamy had been vice-president of this Society and member of the Board of Examiners. Dr. W. J. Love was one of the most beloved practitioners of this section. During the yellow fever epidemic of 1862, while at his post, he contracted the disease, along with a number of his fellow practitioners. Dr. Burbank had been vice-president and member of the Board of Examiners, and for many years was the leader of the profession in Wilmington. Dr. Russell was a member of the Board of Examiners and was active in this Society for a long time. There are others missing to-day, but I especially wish to mention two of the younger members who, without the sounding of trumpets or the blowing of horns, fell at the post of duty during the influenza epidemic of 1918, which played great havoc in Wilmington. Dr. Arnold Stovall, assistant superintendent of health of New Hanover County, and Dr. B. J. Willingham, a private practitioner in the ranks, died at their posts of the disease which they had fought so valiantly, going without food and without rest for unbelievable periods. Their deaths were as glorious as was that of Dr. James H. Dickson of honored memory, who fell a victim to yellow fever in September, 1862, during one of the most malignant epidemics of this disease recorded in history. Dr. Dickson had been president of this Society in 1854, and also president of the first Board of Medical Examiners, and was in every respect one of the most distinguished members this Society ever had. His name is still revered in Wilmington, and side by side with it would I place the names of Willingham and Stovall, who were tried and not found wanting, and who were in their deaths true to their high calling.

In the past there have been many fine influences, not the least of which were of an educational sort, which played a great part in making the local profession a worthy portion of this Society. If time permitted, I should delight in introducing the younger members to some of the historical landmarks of the medical profession in this section of the state, which was one of the first colonies in North Carolina. I should like to show them how in colonial days, there being no medical school in America, our young men were sent abroad to study medicine, and how at one period all of the practitioners were graduates of Edinburgh who had fallen under the sway of the great Cullen and from him obtained the idea of huge calomel dosage which has obtained in this section even until this day. In many ways could I show you how Cullen played a large part, directly and through his pupils, in shaping medical procedure in the early days of our first Society. Again, if time permitted, I would tell you of the imprint made on our profession locally, and transmitted to this Society, by Dr. Benjamin Rush, of Philadelphia, and that great lay physician, Benjamin Franklin. I would show you how our young men going to the first medical school established in America, the University

of Pennsylvania, brought back, through such men as Dr. Moses John de Rosset, the practice of bloodletting and other great principles for which Rush stood. Even today can evidence of the hand of these great teachers in shaping our course be detected. Then I would pass with a single leap to the late forties and early fifties, when our young men fell into the way of going to Paris for added training, and would then attempt to trace out the influence on them, and subsequently on this Society, of the immortal Louis, of Murchison (of England), of Chomel, of Trousseau, of Velpeau, of Ricord, and many others of like position in the glorious past of our profession.

The local medical profession has ever been active in the things for which this Society stands. It is needless for me to waste your time with an enumeration of the things in which the men of the lower Cape Fear section took prominent parts. Suffice it to say that they were ever active in improving medical legislation; in raising educational standards, chiefly through an efficient Board of Medical Examiners; in the gradual upbuilding of an effective Board of Health; and in many other ways in the widening of the field of medical usefulness. As a rule, these men did not contribute to the medical literature of their day, much to our present loss and regret; but a careful study of them as individuals shows that they were men of extraordinary attainments and that the people of this section in days gone by received medical attention of the first order. Though unheralded to the world, our predecessors in the medical profession since the establishment of the first colony on Cape Fear were a worthy group, and we who now labor in the field they once adorned can but hope that the standard they set up shall never be lowered and that the memory of the past may prove to us the inspiration of the future. With the hope that you may find us with our lamps trimmed and burning, as did this Society find our forbears in the days of old, and with the same deep interest in this organization and the things for which it stands, we welcome you.

RESPONSE TO ADDRESS OF WELCOME

William J. Hunnicutt, M. D., Asheville.

Mr. President, Members of the Medical Society of the State of North Carolina, Dr. Wood:

I feel wholly incompetent to respond to this magnificent welcome, giving in detail the history of the rise and growth of our State Medical Society. It is needless for me to say that I bespeak for every member of this Society appreciation of what our friend has said in welcoming us to Wrightsville Beach, Wilmington, and the Cape Fear section. I am truly sorry that Dr. Ringer was unable to be present today, for it is only men of Dr. Ringer's calibre who can respond to such a welcome as the Society has had this morning. We are here from the mountains; we are here from the Piedmont section; we are here from the sand hills, mingling with those from the coast in one common fellowship and brotherhood. Each meeting renews our old friendships and makes new ones; and we

feel that our meeting at this extreme end of the state, on the shores of this great ocean, will be a pleasant affair for us all. Many of us are taking advantage of the natural entertainment as well as that prepared by the physicians of Wilmington.

I can only say, in conclusion, that we of the mountain section express our appreciation for this welcome by extending to the State Medical Society a pressing invitation to meet with us and allow us the privilege, if possible, of exceeding the welcome and entertainment that we shall receive in Wilmington. I thank you.

PRESIDENT'S ADDRESS

THE BALANCED MIND IN MEDICINE

Wm. deB. MacNider, M.D., F.A.C.P.

Kenan Professor of Pharmacology, Medical Department,

University of North Carolina, Chapel Hill.

Mr. Chairman, Members of the Medical Profession of the State of North Carolina, Ladies and Gentlemen:

It is customary for the president of the Society in addressing the organization to express his appreciation for the honor that has been bestowed upon him for the year which has just passed. It appears to me that such an expression of appreciation gains weight by simply assuming the honor of the office and the duties which it imposes. I heartily desire to express to the profession my deep appreciation of the opportunity which this office has given me of knowing in a better and a more intimate fashion the medical men and women throughout the state. During the past year I have visited all of the districts of the Society at the time of their meetings. In some districts I have had the pleasure of more than one visitation. This has carried me from beyond Asheville in the west to Elizabeth City in the east. In addition, the physicians of various county societies have been kind enough to ask me to meet with them, so that I have attended over twenty-eight county societies and other medical organizations. In these visits I have been struck particularly by three things. First, the fine leadership as citizens which our physicians hold in their communities. Second, the sincere and deep interest which physicians show in medical thought and discussion, especially in experimental medicine and deductions which may be made from laboratory experiments. Third, during these visits and with the friendly, intimate association which has been accorded me by physicians in their homes and on their daily rounds in visiting the sick, I am yet to hear one single unkind word or a single harsh criticism by one physician of another. These observations have made me love my brothers in the art of medicine more deeply and have served as a certain spiritual exaltation of the profession as a whole.

I have had great trouble deciding upon a subject for this address; not for the reason of any lack of subjects or any dullness in these subjects, but on acount of my sincere feeling that I am incompetent to address such a group with the wisdom and foresight of the men who have gone before

me in this position. In running over the addresses of past presidents, in some way the address of dear Doctor Tom Anderson appealed to me immensely. It is so full of fine thought and sweetness; it contains such humor and seasoned wisdom, that I should have liked to do something like it. I finally realized that on this occasion, as on all others, whether it be for the better or for the worse, a man should try to be himself. So I have cast aside the guidance which can be found in former addresses of this character, and this morning I want to talk in a simple fashion to a thoughtful and understanding group. As I go along I may "shoot an arrow o'er the house and injure a brother;" if I do, I am sorry, and I ask his pardon. What I have to say is, I feel, for the betterment of medicine in the State, and my highest hope is that there is enough of suggestiveness in this address to provoke thought and honest discussion. At the outset, I should be lacking in understanding if I did not express my appreciation to Dr. L. B. McBrayer, Secretary of this Society, for his help and thoughtfulness during the past year. He has gathered much information for me concerning situations in the State and the activities of other medical societies, so that I might see by comparison what we are doing and what we should do, and he has helped me to understand the policy and background of our organization as it has developed through its years of service.

An organization such as the Medical Society of the State of North Carolina, like an organism, like an individual, is not a static thing; it can not remain stable. It must, like an individual, grow and develop and make new adjustments on the inside and on the outside of its life to an ever changing medical, social, and economic environment. It can not stand still and serve its purpose. It must not be "the first to cast the old aside, nor yet the last by whom the new is tried." If it fails to realize this factor of adjustment which the life within it and on the outside of it demands, if it fails to meet changing conditions, it will find itself unable to live a happy and useful life in its sphere of action, which must always have in it a certain element of sane progress and freshness. With such thoughts in mind, these questions naturally arise; First, what is the function of such an organization; is it growing and adjusting itself in such a fashion as to enable it to meet its obligations; and finally, based on thought, not on emotion, what can be done to better it?

The function of an organization such as this State Medical Society perhaps needs no analysis, for it has lived and is living a useful life; but if we open the windows and permit an air of inquiry to rush in it will at least cleanse and freshen things. Certainly its first function is to encourage the spirit which has dominated the minds and held the hearts of true medical men through all of the past years. This spirit, as I see it, is primarily one of self-forgetfulness and thoughtfulness for others. It breeds a certain sweetness and light which has likely found expression in its highest form in a member of the profession who has recently died, Dr. John Whitehead, of Salisbury. His mentality was acute. He saw sick individuals; and he saw disease not in terms of an isolated disturbance in this or that organ, but he saw it comprehensively in terms of the individual as a whole. He knew through his knowledge of drugs their power and healing value. Through his knowledge of surgery he realized its

value when other agencies in medicine were either not indicated or had failed, and he knew above all that the prime function of a physician is to employ any and all sane measures which will enable an individual once more to adjust itself to a living environment. His healing power was mighty, and his reputation as a physician will last as long as medical men exist in this state. He knew as a fact what so few of the younger medical men do know or have time to appreciate, that an individual is more than a mechanism; he knew that, with all of the science of medicine, there is an art of medicine which is of great importance and in part finds expression in the life and personality of the individual physician; and this life and personality of his, which was of God, he gave to sick people abundantly.

Next to such a spiritual conception of the function of a medical society, its essential duty is to have meetings for one prime purpose; to present medical and surgical thoughts in the form of scientific papers which are of such a nature as to provoke discussion. Nothing should occur at any medical meeting which will interfere with this first consideration. For over twenty-one years I have attended every type and class of medical society meeting, and I am yet to attend one which was not helpful, and which did not teach me something. The essence of medicine is study. I do not mean superficial study, but study of the fundamentals in medicine. The incidentals will come and be forgotten, but the basic things we must dig for and hold to. In this connection, we should think of the master mind in medicine, Sir William Osler, who, during his professorship at the University of Pennsylvania, when patients clamored for his services, when every social opportunity was before him for his enjoyment, turned his back on money and on ephemeral pleasure and spent his week-ends at the old Blockley Hospital performing autopsies from morning until night, and far into the night, studying the relationship of these findings in the deadhouse with what had been recorded on the clinical charts, in order that he might better understand disease. His information became tremendous; his practice later in Baltimore became of such volume that the general feeling is he had to leave in order to have a chance to teach and think. The practice of medicine and the acquisition of medical truth meant work and study to him, and he laid hold on it.

A third function of a medical society is to bring medical men together where they can clasp hands and rub shoulders, so they may better appreciate the fineness and forget the superficial smallness common to all human beings. You will recall in this connection the story told by President Wilson in his Guild Hall address in London. John Stuart Mill is supposed to have remarked to a friend, relative to another person: "I hate that man;" and his friend said, "Why, John, you don't even know him." His reply was, "That's true; if I knew him, I couldn't hate him." The social side of a medical gathering is of great value, but it has no right to dominate the purpose of such a gathering, and this purpose should be one of study and thought and discussion.

Fourth, the State Medical Society should furnish the background through which public health measures and the State Board of Health can operate. There should be no divorce between these organizations. They are dependent, one upon the other. Public health measures and policies, when

contrasted with medical development, are recent adventures in the life of this State. When we think of such measures, we naturally become reminiscent and go backward to the days of Dr. Thomas F. Wood, Dr. George G. Thomas, and in terms of the present to Dr. Richard H. Lewis. It is of interest just now to see the labors and ideals of these men strengthened and made broad in scope through the recognition of such agencies as the International Health Board and the Duke Foundation. When one from among us was chosen to guide one of these agencies our State Board of Health received splendid recognition.

I wonder if we have an adequate understanding of what public health is. The name conveys an idea which is easily tangible; it conveys an idea of preventing disease and preserving health, but do we realize what must come behind all of this in terms of training if public health work is to be sound in its character and enduring? Later I hope to return to this subject.

A fifth function of a medical society is to guide legislation on medical subjects, not in terms of political maneuver and the use of the lobby, but by giving information and facts to legislators in such a form that they can be understood and be of value to such groups in formulating laws relative to the practice of medicine. In this connection I understand that the members of our State Board of Medical Examiners form a group that is legally invested with the power to regulate the practice of medicine in this state. Such a power is given in this country to only a few boards of medical examiners. It shows the faith that the State has in us, and it therefore behooves us to be certain of the group of men we select to perform this important task. I feel that some one man on such a board should have a certain continuity in terms of his office which will enable a new board to appreciate from the start the policy and principle on which past boards have operated in such a successful fashion.

Sixth, it is my feeling that this State medical organization, with its years of active service which have given it stability and sound judgment, should have the guiding hand in all questions of medical welfare in the state. There is in the profession an ever increasing number of highly trained and specifically trained men in all of the branches of medical science. These men should direct the medical activities in welfare organizations. It is one thing to want to be helpful; it is quite another thing to have accurate information sufficient to know how to be helpful. With this thought in mind, I feel that the various welfare organizations should keep in close touch with organized medicine in the state, in order that such organizations can obtain specific information and know how and where it is best to act. Our interest in the welfare of the tuberculous, of crippled children, of the feebleminded, should head up in those men selected by the State on account of their ability to guide such thought.

MEDICAL EDUCATION

In making some statement concerning medical education in the state, I must ask your permission to speak simply as an individual who, on account of having had the opportunity of teaching medical students for

twenty-six years, has the question foremost in his heart. I feel that such an experience enables me at least to think on this subject, which takes its place right at the foundation of what any medical man is to become.

During the past eighteen months, two outstanding contributions have been made to medical education and to the care of the sick in the state through the great wisdom and fine feeling of Mr. James B. Duke. His first idea which came to the public notice, of strengthening and creating hospitals in South Carolina and North Carolina in order that sick people could be more adequately cared for, warmed the hearts of the people in these states as few things have ever done. They had placed before them, with adequate backing, a great humanistic ideal. Following this, the wisdom of some group expressed itself in definite form by giving to Dr. W. S. Rankin the responsible task, with all of its difficulties and high hopes, of putting this scheme into operation. A wiser choice could not possibly have been made.

There are throughout these states hospitals which have been in existence for years, and which have rendered the finest type of service, very likely charity service to a marked degree. Such institutions, if they need it and desire it, should be given first aid in order to go forward with a type of work they have amply demonstrated they are competent to perform. The creation of new hospitals depends upon many factors which are familiar to students of the subject and which are not familiar to me. A hospital, like a teaching institution, is a mechanical contrivance in which the brains and spirits of individuals can operate. A new hospital without the proper mental equipment on the inside might prove a menace rather than a help. It is with these two thoughts concerning the old hospitals and the new that I rejoice that a man of wisdom and thoughtfulness could be obtained to put in operation an ideal which certainly the South has never had and perhaps never dreamed of.

Following close on this first announcement concerning the development of hospital facilities, came the news of the establishment of a medical school as an integral part of Duke University, a school to be amply endowed to train men and women in this section of the South to become the highest type of physicians. My knowledge of this development rests solely on statements by the daily press, which I assume are true and accurate. Likely nothing has ever happened to the profession in the state and in the South which is of greater moment, and which stimulates our imagination more than this benefaction. It carries with it tremendous responsibilities which I feel the profession in the state realizes and furthermore believes will be so handled as to insure the fulfilment of our medical ideal. There are all too few medical schools which have had the opportunity to commence their lives in a fresh, untrammelled field, free from all entangling embarrassments. It is like going into a virgin forest with an abundance of time for thought, and with understanding decide where to build a home and protect it for all time to come. With such a medical school centrally located at Durham, adequately endowed, and built into the intellectual fabric of a great educational institution whose ideals have been established, there are certain questions of State interest and of interest to this society which should be faced. It is a very rare thing for an individual to become sick in just one location and for other

parts of the organism not to participate in the disease. Such diseased conditions which may become generalized are often at first of a very specific character, and their proper handling requires not only the judgment of one physician specifically trained in a certain phase of medicine but a group of such specifically trained men in the various branches of medicine. Consultations are necessary for the understanding of the illness. Very often such studies require hours or days. Research methods have to be employed to handle this case and prepare the way for others. For the above reasons, individuals even though at first specifically sick with one definite disturbance should not be isolated; they should be so grouped that they can command the attention of medical and surgical specialists in a wide variety of fields. If we are to have at Duke University a medical unit of outstanding eminence we should consider the wisdom of grouping around this institution the hospital for the tuberculous, the orthopedic hospital, and the institution for the feeble-minded. These institutions are young; they have not had time enough to acquire such sentimental considerations and physical development based on expenditure by the State as to prevent them from commencing to live in a new location centralized around a learned institution whose life we reckon by centuries. The points in favor of such a reorganization are perfectly apparent from the standpoint of medical education and from the point of view of the institutions under consideration. We must see such things in the long view and not become excited over a temporary interference of decentralized development.

Before leaving the subject of medical education I want to say something about public health education. The old-fashioned public health officer was a pleasant person elected by some county or municipal board; and, from the nature of his training in medicine, and his absolute lack of training in public health, his duties were necessarily superficial. The method by which such officers are elected, their type of training, and the service they render have improved, but are still far from what they should be. Public health education, as we see it in our officials, is not on the same plane of medical education as we see it in physicians, and yet the science of public health has developed even more rapidly than the science of medicine. This work should be done by men who have at least some specific training in their specialty. I feel the public health official in counties and cities should first be a physician. Through his training and contact with people he is in a better position to understand them and with his tact and diplomacy to put into operation the necessary measures which concern themselves with public health. In addition to this, I feel he should have some definite training in public health which he can not obtain from the overloaded curriculum of the medical school. I can not well imagine how the medical schools in this and in other states could be of more use to the State than to give sound, though more or less elementary, courses in the theoretical and practical branches of public health administration. The laboratories of the medical schools are the same as the public health official would require in his training. Courses in biology should be given to provide him with the proper understanding of the life history of those animal parasites so often the cause of disease in man. Courses in hygiene should be amplified to suit his needs. Courses in

bacteriology and milk and water analysis would be offered to give him first hand information. If a physician going into public health work could have as a minimum a year of this type of training, followed by a year of training in the office of the secretary of a state board of health and in a state laboratory of hygiene, with intervals of experience in field work, we should obtain a more understanding type of health official than we can secure at the present time. Furthermore, with this taste of what the science of public health really is, there would certainly be an increasing number of such men who would desire to perfect themselves in this science by some years of study at institutions that have a school of public health. I hope very much our Society and our State Board of Health will give this thought the consideration I feel it deserves.

CONCERNING A MEDICAL JOURNAL OWNED AND OPERATED BY THE STATE MEDICAL SOCIETY

The question of a medical journal of this character is an old one. The North Carolina Medical Journal was founded in 1856, and since that date journals of different types have in part given expression to the medical thought of the state. Various committees have been appointed by the State Society to consider the question of operating a journal as its official organ. In some instances these committees have had to operate under certain handicaps. They have not had the privilege, without any restriction, of considering first the principle as to whether or not it is best for medicine in the state to have a journal; and, furthermore, whether or not a journal could be financed without restricting other activities of the Society. In one instance a committee which made such an investigation was specifically instructed, according to the reading of the motion which created it, to consider the establishment of a journal in lieu of the annual volume of TRANSACTIONS of the State Society. In another case a committee was appointed to consider the advisability of the Society's taking over *Southern Medicine and Surgery* as a State-Society owned and operated journal. I have no hesitancy whatever in expressing my opinion of this journal. It is splendidly edited; most of the papers which appear in it are of the very first quality; the advertisements it runs are, so far as I can see, of an ethical nature; the editorials under various department heads are splendid; and it carries the current medical news of the state. Under the editorship of Dr. J. M. Northington this journal has established itself as one of the best medical journals of a local character. Whether or not this journal should be taken over by the State Society is a question which I have no right even to attempt to answer. A committee, splendid in character, has been appointed to consider this specific question and report back to the House of Delegates. You will of course hear their report and act on it as your judgment best directs.

In my relationship with county and district societies and the State Society for twenty-three years, I feel sure there are many things which a medical journal of the best type and properly edited could do for the profession in the state. The papers in many of these organizations are well worth publication, aside from appearing in the TRANSACTIONS. If such notice were taken of this medical thought, it would stimulate more and better thought. Such a journal, in an issue to appear every two

months, might feature the medical activities in the various districts of the state and confine itself very largely to papers presented in the districts. In this way it would keep in close touch with such organizations and through them with the county organizations. Weak counties would be strengthened. The councilors of the various districts would have a medium through which they could be of real service in the districts and in the counties. If the journal should go to every member of our parent society it would bind together through its medical thought and news our membership and give to the society as a whole a certain solidarity which would be helpful. The editorial offices of such a journal could serve as the source for a packet library system on medical, surgical and public health problems which would be available for physicians in the state to guide and broaden their medical thought and aid in the preparation of papers for the various medical organizations. A monthly medical journal of the type now in mind would very soon exert influence outside of the state and bring before physicians and organizations remote from us an understanding of our medical thinking and activities.

The establishment of such a journal necessitates certain definite considerations. In the first place, from the standpoint of expense, would it be wise to do away with the TRANSACTIONS of the State Society and confine the record of our medical thought and the proceedings of the State Society to a medical journal? The TRANSACTIONS of the Medical Society of our state represent in terms of continuity a history of what has happened medically in the state which is invaluable. There are likely few states in the Union which have so complete a record. My feeling on this question is very definite. Medical journals come and go; editors change; and this record of ours if given up might face the possibility of losing its continuity. I should be opposed under any condition to dispensing with the TRANSACTIONS.

The second question which naturally arises in thinking of a State Society-owned journal is whether or not it is financially possible. This question can not be answered without approaching it in a business-like fashion and giving it detailed study. The society dues would have to be materially increased. State society dues in other states, with one exception, whether they do or do not operate a medical journal, are higher than our dues of $3.00 a year. The annual dues in other states range from $3.00 to $20.00 a year. There was a time when we could truthfully look upon the physician as poor; he will always be underpaid so long as he serves his profession and humanity. At the present time conditions have changed, and I doubt if we can say in truth that there are many poor physicians who could not stand, and be willing to stand for the good of the profession, a material increase in the annual dues. My knowledge of the Society and the attitude of its members to such a question is not what it should be. If an increase in the dues would sacrifice to any appreciable extent our membership, it would be most unfortunate. On the other hand if we could retain the TRANSACTIONS and maintain a clean-cut medical journal by an appropriate increase in the dues, we should strengthen medicine in our state.

A third question, and one of great importance, is how such a journal should be managed. Should it be conducted by the secretary of the So-

ciety who would also act as editor, by a separate editor, of by an editorial board elected by the Society with one of its members serving as editor-in-chief? These are questions of detail for an appropriate committee. The question in general is, I am sure, one in which many physicians in the state are interested, and it would appear wise for a committee of some size first to study the principle of the question without hindrance and give to the Society the benefit of this thought.

A WHOLE-TIME AND PERMANENT SECRETARY FOR THE STATE MEDICAL SOCIETY

By a whole-time secretary I mean a secretary who does nothing but handle the business of the society in all of its many ramifications. This should include the editorship of the journal if we decide to have one. By permanent I mean the tenure of office should be sufficiently long to enable the occupant of the post to demonstrate his ability or lack of ability, to make his contribution if he has one to make, and through it to give expression to his ideals. During the past year I have come to realize that the average physician has no idea whatever of the detail, the importance and the time-consuming character of this position. The presidency of the Society, as we all know, is purely an incidental and ephemeral position. The secretary, with his knowledge of what has gone on in the past and of what is going on in the state and with his relations with secretaries of other state societies and the American Medical Association, holds our organization together. In order for the secretary to be effective for the State Society in these and other broader relationships he should have more time for his work and a longer tenure of office. We should look forward to the time, in the very near future, when this officer is placed on a whole-time basis.

CONCERNING A CONTINUITY OF SERVICE FOR THE SECRETARY OF THE STATE BOARD OF MEDICAL EXAMINERS

Medical licensure and the many duties imposed in connection with the regulation of the practice of medicine have expanded along with other activities of the State and of our Society. The secretary of the State Board of Medical Examiners, in order to handle this position in an effective manner, must know the history of medical licensure and the laws relative to it not only in this state but in other states. Our board has delegated to it by legislative act the power to enforce the laws governing the practice of medicine. Such authority needs background and guidance, which come through a continuity of secretarial service, in order to direct it. At the present time to a greater extent than in the past, it has become the custom of physicians to migrate from one state to another and make application before boards of examiners for license. Such changes necessitate first-hand information on the part of the secretary of conditions in other states in order that the board can act in an understanding fashion. A secretary to a board establishes relationships with such officers in other states and understands the operations of such groups, and through this understanding our board tunes in and coöperates with other boards. The office of secretary constitutes much more than mechanically recording those applicants who have been granted license and those who

have been rejected. It appears important that the office of secretary to a board of examiners should continue and furnish the new boards elected every six years certain detailed information which they need in order to function in a fair and understanding fashion. With this thought in mind the suggestion is made that the Board of Medical Examiners in this state be increased to a body of eight men and that one of the eight elected every six years should be looked upon in the capacity of a permanent secretary and the remaining seven men serve actively in the capacity of medical examiners. It should be understood that the reëlection of such a secretary is to take place every six years, unless there should develop in such an interim definite reasons for his recall.

THE HARRISON NARCOTIC ACT

On account of conditions which have arisen in the state concerning the Harrison Narcotic Act, it would appear natural for some statement to be made concerning it. The good points of the act are too obvious to mention. It has prevented the indiscriminate sale of narcotics and has exerted a restraining influence on the use of these drugs by physicians. On the other hand, it is drastic in certain particulars and embarrassing to physicians who desire to use such drugs as therapeutic agents. There are in this state and migrating into it several hundred addicts to the use of drugs embraced by the act. The question at once arises, what must physicians do to handle this group of mentally and physically sick individuals? With my imperfect knowledge of the law as it now operates, there are only two ways by which a physician can treat a person addicted to the use of such substances. If the addict is poor and can not afford a private institution, he can either be handled as an ambulatory case, by reducing the amount of drug, or he can be committed to one of our institutions for the insane for treatment. The first solution of the problem is beset with well nigh insuperable difficulties. Such patients at once pass on the information to others of their kind, so that a physician handling such a group is likely to gain a reputation far from enviable. In cases such as this the treatment may extend to something more than treatment, and the physician either premeditatedly or accidentally finds himself in a position which demands action such as our present Board of Medical Examiners has had to take during the past year. Their action was definite and just and had the backing of every thoughtful physician.

If such a type of poor patient, or even a patient in moderate circumstances, can not be properly cared for as an ambulatory case, he has only one other resource, commitment to an asylum. Such a course is not fair. The suggestion is made that, if the Federal authorities desire such a law to be carried out in letter and in spirit and permitted to operate in a humane fashion, they have in every state its own institutions for the care of such cases or in part subsidize one or more existing sanatoria in each state for such a purpose.

At the present time, according to the *Journal of the American Medical Association* (Volume 86, No. 19, p. 1473, May 8, 1926), there is a bill before Congress which concerns itself with strengthening the Harrison Narcotic Act of December 17, 1914. The purpose of this bill is to clear up certain points which have been raised in certain courts to the

disadvantage of the Government. As I understand it from this journal, every prescription issued by a physician will be subject to review by any pharmacist who may be called on to fill it. If there are present "circumstances from which the dealer might reasonably deduce that the prescription was not issued by that physician, dentist, or veterinary surgeon in the course of his professional practice only" the pharmacist can not lawfully fill it. There is at once apparent the power this gives to the pharmacist, to a certain extent we assume, over the good and honest judgment of a physician. The pending bill provides that every physician shall keep a record of all narcotic drugs he dispenses or distributes, no matter how small the amount may be, except in emergency cases. Furthermore, "A physician can not, if the impending bill is enacted, dispense or distribute narcotic drugs pursuant to the so-called ambulatory treatment of narcotic drug addiction." There are other features of the bill which will make it difficult for physicians to abide by it. My feeling is that the Society should appoint a committee to study both the original law and the impending drastic revision and express the feeling of this State Society to the Federal authorities concerning it.

In the discussion I have given of various questions concerning our welfare, it has been with no feeling of the possibility of reaching their solution. If in such considerations there is enough thought to demand the attention of the Society, I trust suitable committees will be appointed to take these various suggestions under advisement.

THE BALANCED MIND IN MEDICINE

In conclusion, I want to say a few words on the balanced mind in medicine. All living things appear to be concerned with a certain element of balance. There is a balance in the seasons which influences the processes of life and gives to them a period for activity and a period for rest. There is a balance within the higher organisms without which they are rendered unable to maintain an inward and an outward stable relationship with their environment and function in a normal manner. Body temperature, osmotic pressure, and the relation which exists between acids and bases in an organism are examples of such important balanced states. Nature makes adjustments and effects balances as life goes along, and when nature fails to do this disease prevails. Finally, when we reach the extreme in terms of being unbalanced, death results. We like to speak of individuals as being well balanced. Men such as Clarence A. Shore and James K. Hall are balanced; they can be depended upon and tied to. The mind of man in general fails to work in this balanced fashion. It appears to demand excursions into the extremes of experience in order to orient and balance its thoughts and activities. Certainly in medical thought we have had opportunities to observe such extremes; and as we study such deviations we note that if time be given us we come back to a normal balanced state where we can function effectively. Not so many years ago there were no preliminary requirements of an academic character for the study of medicine. A young man read anatomy in some physician's office; he traveled with him on his visits; and after a year or more he went to some so-called medical center and took a course of lectures in medicine extending over six months to a year. He came back

home as an apprentice, and such an apprenticeship was splendid. I wish we had it now. After a year or more he began the practice of medicine. The other extreme which we are now approaching is quite different. Before long, a young man or woman in order to study medicine must be a high school graduate from an accredited school; he must have four years academic training of the highest and most specialized character, particularly in the scientific branches and with all too little attention to cultural subjects which make for a general understanding and happiness. Following this comes the four years of the medical curriculum, in which attention to many abstractions of theoretical value and to the intricacies of chemistry dominate the mind of the student; and finally one to five years of a hospital internship where refinements in diagnosis and a hunger for autopsies, with all too little attention to treatment, complete his training. This is the other extreme in medical education. It may temporarily restrict the number of physicians in rural communities and lead to overspecialization, but in general it is good and breeds a fine type of medical man. It may have gone too far in another direction; but if we give it time, it will balance itself and be better.

The relationship of the physician to patients has changed. There was a time when the practitioner of medicine was depended upon to do everything of a medical and surgical character, and very frequently he did it in a thoughtful and splendid fashion. As the years went on medical research gave us more information until it was impossible for any one man to do everything. The amount of information concerning disease became so great that no one man could master it and use it. As a result of such development we have now reached another extreme, when a certain number of people with a superficial insight of things medical have gained the idea that no illness can be handled except in terms of specialization and a host of specialists. From such changed conditions in medical knowledge and medical training we occasionally hear statements which tend to minimize the value of the general practitioner. This is a poorly thought out point of view. Is there anything wrong with the general practitioner? Not much; there can't be. People at the present time have a tremendous amount of information about medical questions; and they want physicians of a certain clean, studious type, with fine understanding. The demands made upon the general practitioner often keep him from study and from visiting medical clinics which keep him fresh and interested. If the physician will make this adjustment to the changed order in medicine, his position will be stronger than in the past when it rested to a certain extent not only on information but a certain exacting authority. I can not possibly imagine real medical thought and effective medical organization without the dominating influence of the general practitioner, the family physician. If anything in medicine should ever develop to mar the influence of such men in it as Robert L. Felts, James W. McGee, and Joshua Tayloe, the spirit and art of medicine will have ceased to exist and all we shall have left will be a husk which will rattle and shake itself to death in every materialistic wind that blows. In thinking of such changes in medicine, of the general practitioner representing one extreme (and a sane one) and the

highly trained specialist representing the other (sometimes so highly trained that he has been trained out of the domain of medicine), I believe here again with the help of time an adjustment will be made.

The balanced mind in medicine, the trained and thoughtful mind in any type of endeavor, does not become excited or unbalanced at such changes in experience as we have discussed. It sees such things in the long view and knows that with the help of time an adjustment will be reached in human relationships, just as this same factor has operated to balance the seasons, and to balance and regulate the chemical changes in life. If we look upon these changes in medicine with such a mind, it gives us faith that extremes are transitory and that a normal adjustment will in time take place.

And what do I mean by faith? What do you mean by faith? This balanced mind in medical men is founded on faith; a faith that will enable it to live through the happiness of the triumph over disease, that will enable it to survive in the failure of a hoped-for success, and which makes it know the necessity of holding fast to a Something which is in it all, through it all and over it all—God.

Dr. R. L. Felts, Durham: Mr. Chairman, I doubt if this Society has ever had the privilege of listening to a paper so important as this one, and I move that a committee be appointed to digest this paper and make recommendations to the Society or the House of Delegates.

The motion was regularly seconded.

Dr. J. W. Long, Greensboro: After listening to this splendid address by our President, I never was so proud of being a fellow of this State Medical Society as I am on this glad day. I am sure that I never felt a greater degree of satisfaction on the election of any member of this Society to the presidency, not including myself, than I did when Dr. MacNider was elected (laughter), because I felt that he would honor us by just the work that he has done. Therefore, Mr. Chairman, I am glad to second the motion of my good friend from Durham, but I should like to amend it in this way: That a primary committee be appointed to report to-morrow on the president's address, and that the subcommittees which the president has requested (for instance, on a state-owned medical journal, the Harrison Narcotic Act, and other things which he has suggested) be authorized to consider these various subjects and report at our next annual meeting.

The amendment was acepted by Dr. Felts, and Dr. Long seconded the amended motion.

Dr. H. A. Royster, Raleigh: Mr. President, I do not rise to make a motion but to give vent to what may be called a dignified *emotion*. I glory in this day, and I am proud of the man who has just spoken to us. I believe I have more right than anyone else present to say these words, for this man when a mere boy came as the first associate in medicine that I had. From the very beginning, he gave evidence of the things which he has so eloquently and justly given you today. I have a right to be proud, because I think the chief province of every teacher is to bring up at least one pupil who is greater than himself. If he does that, then he may feel that his teaching ambition has been fulfilled.

This man has a perfect right to stand up here today and tell you what he has told you, for his training has been varied, sound, and full of just the things he himself would like to express. From the very early days when he took "cat anatomy" under Professor Wilson (laughter); with his long service under the greatest teacher in medicine whom North Carolina has produced—Richard H. Whitehead—under whom he learned pathology, anatomy and a real common-sense practice of medicine; from his association for two years as a surgical assistant and teacher of clinical pathology, and his close contact with another great clinical teacher of medicine, even to the present moment as an investigator in pharmacology—from all this varied experience he has evolved, I think, into the most versatile medical man whom we have produced in North Carolina.

So I am not surprised that in him to-day has been fulfilled the promise which I expected of him in 1902. His character has been above reproach. His viewpoint of medicine has been thoroughly scientific. His spirit of inquiry has been associated with only one thought, that of truth, not the truth as some people seem to view it, not your truth or mine, but the truth that comes from truthful study. "Veritas vos liberavit."

Finally, let me repeat the words of Thomas Moore:

"And doth not a meeting like this make amends,
For all the long years I've been wand'ring away—
To see thus around me my youth's early friends
As smiling and kind as in that happy day?
Though haply o'er some of your brows, as o'er mine,
The snow-fall of time may be stealing—what then?
Like Alps in the sunset, thus lighted by wine,
We'll wear the gay tinge of youth's roses again."

Dr. R. S. McGeachy, Kinston: A friend of mine who was in my office last Saturday during the course of his remarks said he had been at the University of North Carolina studying medicine for a year. I asked him, "Do you know Bill MacNider?" He said, "Yes. He has the keenest, prettiest sense of religion that I have ever seen in my life. I have never heard him make a talk to medical students of the University of North Carolina without in some way bringing in something that will make them feel that they ought to be and should be better men."

The motion was unanimously carried, and the chairman appointed the following committee on the president's address:

Dr. R. L. Felts, Durham; Dr. E. J. Wood, Wilmington; Dr. Foy Roberson, Durham.

At this point President MacNider assumed the Chair.

The Secretary made some announcements with reference to the program and the entertainment for the ladies, and the general meeting then adjourned for the section meetings.

SECOND GENERAL SESSION

TUESDAY, JUNE 15, 8:30 P. M.

Dr. William deB. MacNider, President, in the Chair

The meeting was called to order by the President, and announcements were made by the Secretary, Dr. McBrayer, and by Dr. Murphy, Chairman of the Committee on Arrangements.

Dr. MacNider, President:

This is the evening that the Society has decided to devote to having eminent men, out of the state and in the state, address us, and the first address on our program to-night is by a distinguished visitor, Dr. G. Canby Robinson, Dean of the Medical School of Vanderbilt University. He has an ideal there which everyone who knows him feels confident he is able to put into effect, and what that ideal will mean for the South we can only imagine. Dr. Robinson's paper is on "The Use of Digitalis in Heart Disease."

Dr. G. Canby Robinson: Mr. President, and members of the Medical Society of the State of North Carolina: I wish first to express my very hearty appreciation of your invitation to come here and speak to you. Your President asked me to speak on the subject of digitalis, for, as a pharmacologist, he is naturally interested in that subject. I fear that when I get through he may say that I am a pharmacological bolshevic, as I shall probably express some views with which he may not agree. At any rate, I am sure some of the ideas I hold regarding the action of digitalis differ from those generally held.

THE USE OF DIGITALIS IN HEART DISEASE

G. Canby Robinson, M.D.

Dean, Medical Department of Vanderbilt University, Nashville, Tenn.

The employment of digitalis in one of its many forms has become so general in the treatment of heart disease that it is an almost automatic reaction when the diagnosis of heart disease is made. And yet there are few widely used drugs that require for their proper use a more careful study of the patient and keener clinical judgment. Errors arise from expecting too much from too little of the drug, and hopes are sometimes blasted because the exact nature of the cardiac disturbance is not determined. Although digitalis is valuable in nearly all forms of heart disease which has led to cardiac failure, it is more valuable in some forms than in others, and in a few forms of heart disease it is definitely contraindicated. It is impossible to discuss all the questions that such a statement suggests, and I shall confine myself largely to the discussion of the question as to whether digitalis in proper doses actually increases the output of the heart, a problem concerning which I shall present some new facts which are of real importance. The answer to this question is essential not only to an understanding of the action of digitalis but also to a correct conception of the mechanism of cardiac failure.

Let me say at the outset that I use the term cardiac failure to mean a disturbance of the circulatory mechanism dependent upon a derangement of cardiac function sufficient to produce the symptoms and signs of what is commonly spoken of as broken compensation.

I have no doubt that there is a concensus of opinion that digitalis does increase the output of the heart whenever its administration produces an improvement in the symptoms of heart disease. In fact Cushny, one of the foremost students of this drug, in his recent book on digitalis sums up his discussion of this subject by saying that "It may be taken, then, that in therapeutic doses digitalis increases the amount of blood expelled by the heart per unit of time and thus augments its efficiency." There is, however, very little actual evidence that the amount of blood expelled by the heart per minute is increased by the drug, and nearly all this evidence is indirect. It is only recently that methods have become available by which the actual output of the heart can be accurately measured in an intact experimental animal and in man. Such a method has been applied to the study of the effect of digitalis on the output of the heart of dogs by two members of my department, Drs. Harrison and Leonard. They have found to our surprise that digitalis, when administered to normal dogs in doses comparable to those given to patients, usually causes a diminution of the cardiac output per minute of about 25 per cent. The only direct evidence that has been offered that similar results occur in patients with heart disease is found in one case reported by Eppinger, von Papp and Schwarz, who measured the output of the heart in a patient with severe rheumatic heart disease. In this case the cardiac output was about 16 per cent less when digitalis became effective than it was when the drug was started.

Before giving further facts from the recent and unpublished results of my associates, it may be of interest to speak briefly of the method by which the output of the heart may be measured. Of the several methods by which this may be done the most satisfactory at present is that which employs the principle of Fick. It consists in measuring the amount of oxygen consumed each minute, as we do in estimating the rate of basal metabolism, and then measuring the amount of oxygen given up to the body by each cubic centimeter of blood as it passes through the capillaries. Knowing these two facts, the amount of blood expelled each minute by the left ventricle can be calculated, for if 300 cc. of oxygen is consumed each minute, and if each 100 cc. of blood gives up 5 cc. of oxygen, then six liters of blood must be expelled each minute by the left ventricle in order to carry the 300 cc. of oxygen. The greatest problem involved in the method is measuring the amount of oxygen given up by a unit of blood. This is done in experimental animals by obtaining a sample of arterial blood in a syringe by puncturing an artery and analyzing it for its oxygen content, and by obtaining a sample of venous blood by inserting a needle into the right ventricle, and determining its oxygen content. This may be done in dogs apparently without pain to the animal and usually without any struggling. Of course this procedure can not be carried out on man, but other rather complicated methods have been devised, so that this principle of measuring the cardiac output can be applied successfully to man. Harrison

and Leonard had several trained dogs that would lie still and breathe from a spirometer with a tightly fitting mask over their noses and would show no objection when the blood was withdrawn. Morphia was given to other animals in order to keep them quiet. Digitalis was given to their animals as digifolin (Ciba) intramuscularly, the initial dose being never more that 0.5 cc. per kilo of body weight, which corresponds to approximately 3.0 grams of the powdered leaf for a man of 150 pounds, a maximum therapeutic dose. This dose was usually divided and given over a period of eight or twelve hours. The cardiac output was determined, and electrocardiograms were taken, before and every three to five hours after digitalis was begun. To a few dogs thyroid extract was fed in order to produce an increased metabolic rate and an increased cardiac rate. Some dogs were studied after having been bled, while in one instance spontaneous auricular fibrillation was found, allowing an especially interesting set of observations, closely resembling conditions occurring in patients. In all, nineteen dogs were studied, and the cardiac output was measured 57 times after the administration of digitalis. Of these 57 determinations 54 showed a definite decrease in the output of the heart per minute.

Some of these experiments may be mentioned briefly, as the results obtained have been of special interest. In one case the cardiac output was studied in a dog before and after morphia was administered. The cardiac output was reduced 8 per cent after the drug was given. This was followed by the administration of digitalis, which caused the cardiac output to fall 34 per cent of the output before digitalis was given. The dog with auricular fibrillation as revealed by the electrocardiograms showed a steady decline in cardiac output without any definite change in cardiac rate.

In one animal in which the cardiac output was followed after a single dose of digitalis, the maximum decrease in output occurred two days after the drug was given, while the output did not return to normal until six days had elapsed.

I believe the case is proved by these experiments that digitalis diminishes the output of the heart in normal dogs. That being a fact, two questions immediately need to be answered: (1) Does the drug also diminish the output of the heart of patients with heart disease; and (2) If it does have this effect, why is it beneficial to such patients?

In regard to the first question, as to whether digitalis diminishes the output of the heart of cardiac patients, we have but little direct evidence, namely, the one case in which such an effect was found by actual measurement by Eppinger, von Papp and Schwarz. But there is some important indirect evidence. The same authors found that morphia usually diminished the cardiac output in normal subjects and in patients with heart disease, and we all know the striking benefit morphia has in certain types of heart disease, especially those with sudden heart failure and marked edema of the lungs. Everyone knows also that cardiac patients are more comfortable when sitting up, and many times their lives seem to depend on their assuming the sitting posture. This has a direct bearing on the question under discussion, because recently Bock and Field have found that the cardiac output is diminished from 25 to

50 per cent when a person shifts from the prone to the sitting position. Their observations have been confirmed by two other workers in this field. These authors believe that it is the diminished cardiac output that relieves the congestion of the lungs and adjusts the pulmonary circulation to the purposes of respiration. Our own experience in measurements of the output of the human heart testifies to the correctness of these findings. Another piece of work that bears on this question is the report by Levy that the size of the heart, when determined by careful x-ray studies, was found to be diminished in cases of pneumonia to whom digitalis was given. There is therefore sufficient evidence for belief in the conception that digitalis diminishes the output of the heart when used therapeutically, and that its beneficial effects are dependent on this diminution of cardiac output. I say belief in the conception, because there is not as yet sufficient direct evidence for this conception to consider it as proved.

The second question, why is the circulation improved by diminishing the cardiac output, leads us further into the realm of speculation. The answer I wish to make to this question is the following. Generally speaking, the signs and symptoms of cardiac failure occurring in heart disease are not primarily caused by the inability of the heart to expel the amount of blood needed by the body to carry on its functions, but they are primarily caused by a lack of perfect balance of the work of the right and left sides of the heart. A diminution in the output of the heart favors the readjustment of the work of the two sides of the heart, especially the proper coördination of the right and left ventricles. This I believe to be the essential duty that we should expect digitalis to perform. We should contemplate the heart as composed of two chambers, the right and left ventricles, the functions of which are not only to expel blood, but to receive blood. If the right heart weakens and is not able to expel all the blood that enters it, there is also failure in its ability to receive the blood that is brought to it, and venous engorgement results. This in turn leads to edema of the feet and legs, swelling of the liver, ascites, and hydrothorax, with congestion also of the muscles and of other viscera. A minute lack of balance resulting in an output per beat of the left ventricle slightly in excess of the amount the right ventricle can receive must quickly lead to marked engorgement of the systemic veins. This is seen most readily in the veins of the neck. If the lack of balance be reversed, and the left side of the heart fails, then it is unable to receive all the blood the right heart sends into the pulmonary circulation. Pulmonary edema is the result. Under these conditions a diminished cardiac output favors the restoration of balance between the two sides of the heart. Another point in favor of the conception that it is not a diminution of cardiac output that is responsible for cardiac symptoms is the fact that during attacks of cardiac failure the output of the heart is greatly increased. This is another fact brought out by the work of Eppinger and his co-workers.

With all the compensations that the heart is called on to make in order to maintain a perfect balance between the right and left sides in spite of leaking or stenotic valves, localized damage of the cardiac muscle, changes in the peripheral paths caused by arterial sclerosis or

pulmonary lesions, it is not remarkable that the delicate balance of the two sides of the heart may be thrown out. It is the drug that helps to restore this balance that serves a useful purpose. And this I believe to be the main and fundamental function of digitalis.

It is necessary to make some exceptions to the statement that the symptoms of heart failure are always caused by a lack of balance between the work of the right and left sides of the heart. There are cases, such as paroxysmal tachycardia and probably others associated with extremely rapid cardiac rates, in which the output of the heart is diminished. One such case of paroxysmal tachycardia has been studied by Barcroft, who showed by actual measurements that the output of the heart was strikingly diminished during the attacks of rapid heart rate. The patient had symptoms apparently produced by the decrease in the minute output of the heart. No doubt patients with extensive disease of the myocardium likewise have a decrease in the cardiac output. I am of the opinion, without definite facts to back it, that such cases in which symptoms are referable to diminished cardiac output fail to show any improvement which is directly attributable to the drug when digitalis is administered. A method of distinguishing such cases in which no benefit from digitalis is to be expected from those to whom the drug should bring relief is a problem to which we are giving thought, and which should be solved when the cardiac output of severely ill patients can be measured. Digitalis is, however, usually of definite benefit to patients with heart disease and should be used in doses of sufficient magnitude to affect the heart promptly and definitely.

Dr. MacNider, President:

I stated a while ago that this evening meeting of the State Medical Society is given over to addresses by eminent guests from out of the state, but I did not see the necessity of going out of the state to get some eminent speaker to talk to us on the next subject, when we have one in North Carolina. The urological clinic conducted at Charlotte by Dr. Crowell and his associates is one of the outstanding things in the South. When a man in this state has established a clinic which ranks with the urological clinic at Johns Hopkins and with the Mayo Clinic, he has made a real contribution to Southern medicine. We shall now hear from Dr. A. J. Crowell, of Charlotte, who will speak on "The Curve of 'Phthalein Excretion; Its Interpretation and Clinical Use."

THE CURVE OF 'PHTHALEIN EXCRETION; ITS INTERPRETATION AND CLINICAL USE

A. J. Crowell, M.D., F.A.C.S., Charlotte*

Since the introduction of phenolsulphonphthalein as the test dye of kidney function, it has been sufficiently studied experimentally and clinically to be recognized by the profession as the most useful single means of testing renal function. There has been, however, some reservation in the minds of all as to its infallibility. Many of us have seen cases of nephritis and cardiovascular hypertensive renal disease in which

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the total 'phthalein in two hours was good and blood nitrogen still normal although the kidney injury had reached a fairly advanced stage. The two-hour test, however, repeated and administered under different conditions, gives at least a rough estimate of the kidney's reserve power, but does not enable one to detect early kidney lesions satisfactorily nor to differentiate their types.

All of us who do genito-urinary surgery have relied largely upon the hourly 'phthalein output and blood nitrogen estimation as a guide to operability, and yet it has been hard to fix arbitrarily a 'phthalein output above which operation may be performed without danger of the patient's developing postoperative renal insufficiency. We have seen patients with a very poor two-hour 'phthalein output, taken at hourly intervals, do extremely well following prostatectomy, and others with a fairly good total output develop postoperative uremia and have a stormy recovery, or even die. In the former instance there was kidney reserve power and none or but little in the latter. Shaw, working at the Brady Urological Institute, observed these same phenomena and was led to estimate the time element of the 'phthalein elimination in both the healthy and diseased kidney. He apparently finds in the *plotted* curve dye elimination a satisfactory explanation of the previously mentioned clinical discrepancy in that the peak of the 'phthalein elimination was reached within the first fifteen minutes in the healthy kidney and delayed in the diseased one in proportion to the type and extent of the injury. Over half the dye recovered in two hours was eliminated by the healthy kidney during the first fifteen minutes, and in the diseased kidney its elimination was delayed in proportion to the extent and character of the disease. This explains why the kidneys may be diseased and yet sufficiently active to prevent undue nitrogenous retention until reserve is needed in sickness or operation, where it is wholly inadequate. The peak of elimination may be delayed and yet the total output in two hours' time fairly good, although the kidneys may be extensively diseased. The greater the delay in the peak and the more gradual the decline in the curve of dye excretion, whether taken in fifteen or thirty-minute intervals, the more extensive is the kidney involvement. For all practical purposes the half-hour intervals are sufficient. We have used this method to check Shaw's findings in the healthy kidney and have used it sufficiently in various pathological conditions in which it is applicable to be thoroughly convinced of its great value in enabling one to ascertain the degree and often the character of the involvement.

It has been definitely shown by Rowntree and Geraghty, and it has been quite generally accepted by the profession, that the 'phthalein elimination is independent of the fluid output. Some observers think, however, that its elimination may be increased somewhat by the fluid output in severe cases of interstitial nephritis. This makes the fluid output, as a rule, insignificant, but it is of great importance that the entire interval's secretion should be secured for estimation. In case of chronic retention due to hypertrophy of the prostate, stricture, nerve lesion, or any pathological condition resulting in retention, the catheter should be used and great precaution taken to obtain the entire interval's output for the estimation. Hydronephrosis is another condition which might be misleading and should always be kept in mind.

Kidney injury, due to chronic retention and infection, which are practically always associated, is not necessarily in proportion to the amount of residual urine or length of time it has existed, but, as a general rule, the longer it has persisted, the more certainly there will be renal damage. We have observed cases with little residual, as is usually the case in malignant prostrates, in which extensive pressure atrophy existed as a result of the frequent efforts to empty the bladder. Here we have back pressure of a different type from that resulting from large amounts of residual. In cases of renal injury due to back pressure, the first half hour's output indicates the extent of damage done as well as what may be expected following drainage. Shaw observed that in fifty-six cases of known renal lesions, tested out and reported at the Washington meeting of the Genito-Urinary Surgeons' Association, February, 1926, the majority of them were due to back pressure and infection. Following drainage, the peak of elimination occurred earlier as the function improved, while the two-hour output may have remained unchanged. We have observed this same phenomenon in our work clinically and find ourselves depending more and more upon the peak and curve as a guide to operability in case of hypertrophy of the prostate.

MacNider's experimental work demonstrates that renal injury is *produced more easily, develops more rapidly,* and *persists longer* in older animals than in young ones. This should be a warning to all of us, and especially to the genito-urinary surgeon, against undue haste in operative procedures upon old people. He shows that in cases of tubular injury in animals the earliest functional indication of this injury is the appearance of albumin in the urine and a reduction in the 'phthalein output. Coincident with these signs there appears a disturbance in the acid-base equilibrium of the blood. This is an important fact to be kept in mind, but it is too great a field to enter upon in this paper.

We have followed the curve of 'phthalein elimination repeatedly in nearly one hundred cases that have presented themselves at our clinic for examination and treatment. This group includes a number of cases showing an apparent normal kidney function as well as those showing varying types of kidney function disturbance, arising both from conditions treated surgically and from diffuse nephritis of purely medical type.

Shaw's type curves have been duplicated in the testing of our own cases, and we feel that his interpretations and deductions are correct. Emphasis should be made on the value of these observations as a guide to operability and subsequent progress, especially of those cases presenting renal injury due to prostatic obstruction.

Furthermore, the dye excretion curve is of great value as a means of diagnosis of certain forms of nephritis which might otherwise be overlooked and is an indication of the subsequent course of the disease. In the cardiorenal hypertensive type, repeated determinations are an excellent indicative guide as to the progress of the case.

Dr. MacNider, President:

The usual thing, I suppose, for a surgeon or medical man when he gets his training is to do a great deal of hard, earnest clinical work. When that is done, success is generally attained, and a certain degree of satisfaction. There are some souls that can not stop there but are eternally asking themselves the reason why, and if a thing can not be done in a different and better fashion; and with some souls that urge is so strong that they try to go ahead and do it in a better fashion, and they make the advances in surgery and medicine. That type of individual, I believe, is found in Dr. J. Shelton Horsley, and not only has he made such contributions for himself, but he has made them for Southern medicine and surgery. Dr. Horsley has the concluding paper of the evening, on "Stomach Trouble."

Dr. J. Shelton Horsley, Richmond, Va.:

In the first place, I wish to try to express my very great pleasure in being here, particularly under the auspices of President MacNider, whose research work has been of such high character and is known wherever scientific medicine is taught.

"STOMACH TROUBLE"

J. Shelton Horsley, M.D., F.A.C.S.,
Richmond, Va.

Headache, backache and stomach trouble make up a large proportion of human miseries. In this group, stomach trouble looms large. Most diseases that are serious and many trivial affections are accompanied by some stomach symptoms. Stomach trouble may develop from a tumor of the brain or an infection of the foot. In the symptomatology of practically all the acute infectious diseases one of the first symptoms is anorexia, nausea and vomiting. Toxic conditions of all kinds may cause anorexia or nausea. Psychic shock or worry, trauma and improper diet are common causes of stomach trouble. These causes usually produce symptoms without gastric lesions. Organic affections of the stomach, such as ulcer or cancer, give rise to stomach trouble, though occasionally they exist for a long time without any gastric symptoms.

In such a chaotic and confused aggregation of causes for so common a complaint, it is natural to expect there will be divers and sundry remedies, many of them empirical and many of them inefficient. Much of this confusion, however, can be clarified by a study of the physiology of the stomach. It is impossible to have a proper conception of the abnormal workings of an organ or a machine without an understanding of the normal function. No one would undertake to diagnose or treat an imperfectly running motor without some conception of how it acted when things were going well. And yet in treating stomach trouble too frequently empirical remedies are administered without any consideration of the normal action of the gastro-intestinal tract. Numerous diets are exploited ranging from raw eggs to sauerkraut. Cultish methods of regulating diet, in which mastication must be carried out in a definite manner and time, or in which certain classes of food must either be adopted or avoided just on general principles, have their peculiar advocates. Occa-

sionally these methods succeed, which makes their adherents all the more enthusiastic. The same thing is true of cults in general. If an automobile mechanic would insist upon regulating the carburetor for every trouble of a motor, it is, of course, conceivable that in some instances his adjustments would correct the trouble; but when a spark-plug is dirty or a cylinder cracked, or the distributor is broken, the carburetor adjustment would be of no avail. In treating stomach troubles various phases of this complaint can be properly comprehended only with a conception of normal function. A study of function necessarily implies a knowledge of structure, so we will briefly review the embryology and structure of the stomach in order that we may clearly discuss function.

Embryology

The stomach first appears as a laterally flattened fusiform enlargement of the foregut in embryos 4 to 5 mm. in length (twenty days old). As this enlargement descends the digestive tube above it is elongated, forming the esophagus. This appears about the fourth week. A short distance distal to the primitive stomach the foregut opens freely into the yolk sac. This opening at first is wide, but later is narrowed into a small tube called the yolk stalk or vitelline duct. The allantoic duct arises from the caudal, or blind, end. As the development proceeds the stomach dilates locally to form the fundus and the subsequent greater growth dorsally forms the dorsal greater curvature. At this time the stomach faces right and left. The intestinal tube is lengthened, and the attachment of the mesoderm dorsally is drawn out and forms a common mesentery, which is along the greater curvature of the stomach and lies dorsally.

The greater curvature of the stomach develops much more rapidly than the lesser curvature, and gives the characteristic appearance to the stomach. The stomach rotates and the vagus nerve is carried with it, so that the left vagus is on the ventral surface of the stomach and the right is posterior. During the second month the epithelial growth in the esophagus almost occludes the esophagus, but at the end of this time vacuoles appear in the epithelial cells and serve to enlarge the lumen of the esophagus. Persistence of this constricted condition in the embryonic esophagus produces congenital esophageal stenosis. During the sixth month the cecum normally descends into the right iliac fossa, and the intestines are elongated. The proximal part of the yolk sac or vitelline duct disappears during the fetal life. Occasionally it persists and forms a sac known as Meckel's diverticulum.

Anatomy

The outlines of the stomach are changeable, and depend not only upon the individual but upon the position of the body and upon the contents of the stomach. For these reasons it has been difficult for different observers to fix upon the anatomical division of the stomach. For purposes of anatomy the outline by Cannon, or some slight modification of it, is usually found satisfactory. This divides the stomach by the notch at the lesser curvature, the incisura angularis, or reëntrant angle, and a line is drawn from this point to a point opposite it on the greater curvature.

To the right of this line is the pyloric portion, and to the left is the cardiac portion. The part above a horizontal line through the cardiac orifice is the fundus. Between the fundus and the incisura angularis is the body of the stomach, or the pars media. The pyloric portion of the stomach is divided by some observers into three parts, and by others into two. The portion of the stomach, about 3 cm. long, which terminates in the pyloric sphincter is the pyloric canal; and that portion between the pyloric canal and the incisura angularis is the pyloric antrum. The antrum is sometimes subdivided into the antrum and the vestibule, but this seems unnecessary.

The stomach has three layers of muscle. The outer layer is the longitudinal and is a continuation of the longitudinal muscle of the esophagus. This coat forms a narrow and powerful band of muscles along the lesser curvature and a broader but feebler band along the greater curvature. The bundle along the lesser curvature spreads out in the pyloric region and becomes thinner at this point. The middle or curvature layer is arranged in circular bands which cover the stomach, with the possible exception of the fundus. This layer is directly connected with the circular muscular coat of the esophagus and of the duodenum. It is particularly powerful at the pylorus and serves to form the aggregation of muscle making the pyloric sphincter. The transition of these circular fibers to those of the duodenum is sudden, though the connection is plain. The third and deepest layer of muscle fibers is the oblique layer. Upon the anterior and posterior borders of the stomach these oblique fibers diverge, and along the lesser curvature they run parallel.

The mucous membrane is separated from the muscle of the stomach by the submucosa, which supports the blood vessels and lymphatics and Meissner's plexus, that is distributed to the mucosa. The larger plexus, or the myenteric plexus, of nerves is between the longitudinal and circular muscular coats. The blood vessels in the pyloric portion of the stomach and in the first part of the duodenum have a peculiarly long course, which predisposes to thrombosis. In the cardiac portion of the stomach the gastric glands are long and tubular and contain chief cells and parietal cells. The chief cells are called central or peptic cells and secrete pepsinogen, which makes pepsin. The parietal cells are responsible for the hydrochloric acid, though it is probable that they do not secrete acid as such but as ammonium chlorid. The pyloric glands secrete no acid or pepsin, but a clear material which is alkaline in reaction. It is important to know this. Brunner's glands penetrate into the mucosa of the pyloric end of the stomach for some distance.

The extrinsic nerve supply of the stomach is from the vagus and the sympathetic. The vagus was formerly supposed to carry all the motor impulses and the sympathetic the inhibitory. As a matter of fact, the vagus is a bundle consisting of a number of fibers of different types, and while many fibers that conduct motor impulses are undoubtedly contained in the vagus, some that carry inhibitory impulses are found there also. The sympathetic likewise carries some motor fibers in addition to its fibers for inhibitory impulses.

Physiology

There is probably no absorption of food or water from the stomach. Highly concentrated sugars may be absorbed to some extent. Alcohol

and drugs are freely absorbed from the mucosa. Food in the stomach at first retards peristalsis. During this time the ptyalin from the saliva may continue to act upon the starches until the medium becomes well mixed with the acid gastric juice and is in reaction. Ptyalin acts in both an alkaline and a neutral medium. Peristalsis seems to begin about the middle of the body of the stomach and proceeds with increasing vigor toward the pylorus, while the fundus and the adjoining cardiac portion are in tonic contraction. Cole has shown that there are one, two, three or four cycles in the gastric peristalsis, and that most stomachs empty on the four-cycle arrangement; that is, that four different waves can be noted at the same time. There is a period of contraction, or a systole, and a period of diastole. The systole occupies seven-tenths of the time of the cycle, the whole cycle lasting two to three seconds. Not all of the waves that originate in the body of the stomach reach the pylorus. Klein has shown that some of them go only so far as the pyloric antrum, and also that others apparently originate about the pyloric antrum and proceed toward the pylorus. Klein has also noted that the solid material impacted in the pyloric antrum reverses peristalsis.

The mechanism of the emptying of the pyloric sphincter is interesting. Formerly it was thought by Pawlow and Cannon that the pyloric sphincter emptied largely by chemical control; when the contents of the stomach became very acid the pyloric sphincter relaxed, and when the contents of the duodenum became slightly acid it contracted. It is true that contraction of the pyloric sphincter can be initiated by placing a strong acid on the duodenal mucosa, but this doubtless only acts as an irritant, because mechanical trauma of the duodenal mucosa will have some effect. Besides, if excessive acids of the stomach were necessary for the pylorus to open, in cases of achylia the pylorus would never relax. According to Cole, Luckhardt and others, the pyloric sphincter probably relaxes somewhat with each strong gastric peristaltic wave that reaches it.

Alvarez in the last few years has shown that peristalsis is to a large extent myogenic in origin. While the external nerve supply has much to do with conducting reflexes from a distance, the essential work appears to be myogenic in peristalsis of the stomach and intestines somewhat as it is in the heart. The lesser curvature, as has been noted in the embryologic development, is the original, practically unchanged, portion of the gastro-intestinal tract; the greater curvature is the portion that has bulged out and become distorted. Alvarez has shown that if a strip of muscle is taken from the lesser curvature near the esophagus and placed in oxygenated Locke's solution, it will have a rythmical contraction of eleven per minute, whereas a strip taken from near the pylorus on the greater curvature will contract at the rate of two per minute. Similarly a strip from the duodenum will contract about twenty times a minute, whereas in the terminal ileum the contraction is only about ten times per minute. In this way peristalsis results from what he terms gradients, and from the most sensitive and active portion the movement is initiated. During peristalsis of the stomach the cardiac portion is in tonic contraction and acts as a rubber bag forcing food into the pyloric portion of the stomach, where peristalsis is active.

Klein has confirmed Alvarez' work. He thinks that portions of the lesser curvature near the esophagus and also the incisura are centers, somewhat like the sino-auricular node of the heart, where the impulse for peristalsis is initiated and peristalsis begins as ripples that are unobservable in x-ray until the more pronounced contraction appears about the middle of the body of the stomach. He has shown that an ulcer along the lesser curvature will produce spasm of the corresponding segment of the stomach, whereas an ulcer on the greater curvature may produce practically no spasm or symptoms. Experiments in which the lesser curvature has been injured or removed have shown that there is marked interference with the emptying of the stomach; but if the stomach of an animal is divided almost down to the lesser curvature and the lesser curvature left intact with even a small opening, little or no interference with the emptying occurs.

The theory of Edkins that there is a specific hormone secreted by the pyloric mucosa of the stomach which is absorbed and stimulates gastric juice has not been proven. There are many substances which injected into the blood will cause a secretion of gastric juice, such as extract of strawberry, meat extracts and extracts of spinach.

Carlson has stated that there is no such thing as hyperacidity—that the variation is chiefly downward, beginning with one half of one per cent hydrochloric acid. He thinks that the gastric juice has been too much glorified, and in a study of gastric function in three individuals in whom there was a gastrostomy because of cicatricial esophageal stenosis he was able to draw out the so-called appetite gastric juice, and digestion would proceed fairly satisfactorily. Ivy in more recent work has elaborated the causes of gastric secretion. Pawlow has pointed out the appetite gastric juice, which comes from the sight or smell of food and from the sensation produced by food in the mouth. Later the presence of food in the stomach causes gastric juice to appear. This is not absolutely mechanical, because inert substances such as sand, applied to the gastric mucosa, produce no gastric juice but cause mucus. The stimulus of food for gastric juice is not clearly understood, but meat extracts and bread in which there is a certain amount of protein undoubtedly stimulate gastric juice markedly. Ivy has shown that some substance stimulating the secretion of gastric juice is absorbed in the blood during the digestion. A spastic pylorus or mechanical obstruction which delays the emptying of the stomach and prolongs the contact of food with the gastric mucosa will cause an increase of gastric juice and produce an apparent hyperchlorhydria, which is really due to the normal reaction of the stomach to the prolonged contact of food. Measures that tend to empty the stomach more readily without irritation will lessen the amount of gastric juice.

The chief action of the gastric juice is on the proteins, which it converts first into acid albumin or syntonin, then into primary and secondary proteoses and finally into peptones, and this process is continued still further to amino-acids in the small intestine. Fats and starches are practically not acted upon at all in the stomach. Proteins, then, not only call for gastric juice but also stimulate peristalsis.

The acidity of the gastric juice varies not only from one individual to another but varies in the same individual from time to time. The hydrochloric acid and the pepsin in the gastric juice are still more concentrated when the gastric juice is secreted rapidly during the process of gastric digestion. The presence of a high degree of hydrochloric acid, or so-called hyperchlorhydria, is not necessarily a forerunner of ulcer. Dragstedt in dogs in which there was a low hydrochloric acid content in the gastric juice produced an artificial peptic ulcer, and found the hydrochloric acid content was elevated. We know that in other regions the presence of an irritant often tends to increase the secretion, so it seems more probable that if there is any relation between high hydrochloric acid content and ulcer, it is one in which the ulcer is probably the cause and high hydrochloric acid the effect.

Derangements of Gastric Function

Probably the most common of the serious deficiencies in the secretion of gastric juice is the lack of acid, or achylia gastrica. This may be due to many causes, some of which are not thoroughly understood. Most of the cases of achylia gastrica are probably due to some toxic substance which affects the glands of the stomach and so diminishes secretion. For example, in pernicious anemia achylia is an early and most constant symptom. Cancer in any portion of the body elaborates a toxic material which often causes achylia gastrica. This is particularly true of cancer of the stomach, possibly because of the proximity of the malignancy and consequently greater opportunity for the gastric glands to be affected. There is nothing pathognomonic, as is sometimes supposed, in the lack of acid in the gastric juice in carcinoma of the stomach, because this condition occurs from carcinoma elsewhere. Whether the cause can be definitely ascertained or not, the administration of large quantities of dilute hydrochloric acid, about 1 dram in water three times a day, may be beneficial.

At least eighty per cent of stomach troubles are due to interference with the motor mechanism, and not from affections of secretion. The stomach has a sensory nerve supply which is small, and the sensory fibers terminate in the muscle and do not reach the mucosa. When there is a lesion, as an ulcer in the pylorus, the accompanying congestion sensitizes the nerve fibers and makes them more liable to impulses of pain, just as would hyperemia on the hand around a boil make the nerve fibers supersensitive. Consequently, contraction or spasm which under ordinary conditions would cause no discomfort may give rise to pain when there is hyperemia from an ulcer. Then, too, Cannon, Carlson and others have shown that hunger pains may be produced by prolonged fasting. Hunger pains are synonyms with intense contraction of the stomach.

While undoubtedly the theory of Alvarez, of the myogenic origin of peristalsis, which has been confirmed by Klein, holds for most of the actions of the stomach, because the extrinsic gastric nerves can be severed in the lower animals and while peristalsis may be markedly interfered with for a few days it will eventually proceed almost normally, it does not mean that the external nerve supply is unnecessary. Many reflexes are caused in this way. Roentgenologists have noted the ileocolic reflex, by which when the lower ileum empties into the cecum the pyloric

sphincter relaxes almost immediately. The work of Alvarez has, however, served to give a logical explanation for many phenomena of stomach trouble which heretofore could not be explained. He has shown, among other things, that the sensitive muscle where peristalsis is initiated and where the rate of contraction is high is more profoundly affected by toxic influences than the more slowly contracting muscles. In dogs or cats with influenza he has found that the muscle in the lesser curvature near the esophagus is profoundly affected and contracts more slowly than normally, whereas muscle near the pylorus may be but slightly affected. When strips of the highly active muscle from the lesser curvature are placed along with strips of slowly acting muscle in Locke's solution, both contracting at their respectively proper rates, it will be found that the rapidly contracting muscle will be affected by the gradual reduction of oxygen in the Locke's solution before the slowly contracting muscle. It is not only more sensitive, but it is less hardy.

Interpretation of Symptoms

With these physiological facts before us, much can be explained that was formerly but poorly understood. We can see how acute infectious diseases, such as measles, pneumonia, and diphtheria, will cause nausea and possibly vomiting, because toxins affect the sensitive muscle along the lesser curvature near the esophagus where peristalsis is initiated; whereas the slower and more hardy muscle is but little affected. In this way the mechanism of peristalsis is upset, and it may be that there is sufficient change to produce an actual reversal by slowing the muscle. Thus there may be anorexia and nausea, and possibly vomiting. We know, too, that pylorospasm is affected reflexly, and that the impulses are carried largely through the vagus nerve. Acute appendicitis produces impulses through the vagus, which tend to produce contraction of the pylorus; and the firm contraction may not only cause pain but may so elevate the muscular activity in this region as to cause vomiting.

Walter Hughson, of Johns Hopkins Hospital, in some very clever work, has shown that in marked reflex pylorospasm caused by distal injury in the peritoneal cavity, the section of the vagus nerve just below the diaphragm will relieve the pylorospasm, as it breaks an arc in the reflex.

Analyizing, then, such simple troubles as biliousness, waterbrash and heartburn, we can find a logical explanation. Stomach trouble or so-called indigestion may be assumed to be due in a large proportion of the cases to an upset of the motor mechanism. If there is irritation about the pylorus, pylorospasm and delayed emptying may occur. If there is toxic affection of the more sensitive muscles, they may be so weakened that the gradient will not satisfactorily empty the stomach; or there may be a combination of these two effects. So-called biliousness or coated tongue is due, according to Alvarez, to reversed peristalsis, from irritation of the pylorus or lower in the gastro-intestinal tract; the cardiac sphincter is relaxed, and the gastric juice is extruded into the esophagus. It reaches the upper part of the esophagus, where is smooth muscle fiber, and is quickly swallowed, but a bitter taste is often left. Alvarez has noted that in cases of heartburn almost always the contents of the eso-

phagus are acid, where normally they would be alkaline. This is not due to any excess acid of the gastric juice, but gastric juice does not normally belong in the esophagus. In women who are pregnant, when the activity and gradient of the lower segments of the intestine are raised because of the hyperemia of pregnancy, it is a common thing to find nausea, sometimes vomiting, and decay of the back teeth from regurgitation of the gastric juice. It does not seem probable that a physiologic condition such as pregnancy should always be accompanied by nausea due to a toxemia. Toxemia is pathologic, but pregnancy is almost always accompanied at some time during the term by nausea, heartburn, and waterbrash. The coated tongue is due often to a regurgitation of the gastric and duodenal contents. The mucosa of the tongue has no unusual glands and is coated either because of sepsis in the mouth or sinuses or by regurgitation of the gastric and duodenal contents. In other words, fecal contents from the small bowel come back in cases of biliousness or in cases of upset motor mechanism and coat the back of the tongue.

Treatment

The practical application of these things is obvious. First of all it should be determined whether the stomach trouble is due to psychic influences, to toxic material or to a spasm. There is a possibility of the secretion causing it, but this is not great. If there is a toxic cause, such as a focus of infection, this should be treated and automatically the stomach condition should be relieved. If the nerves are supersensitive from anxiety or from psychic influences, this should be attended to. It is well known that the secretion of bile has nothing to do with so-called biliousness. A temporarily deranged motor mechanism may sometimes be set aright by a purgative. The administration of alkalies, and particularly of soda, often gives relief from stomach symptoms. This is primarily not because of neutralization of the acid, but because a high acid content of the gastric juice may tend to increase peristalsis and also probably there may be some indirect effect of the soda upon the muscles of the stomach. Alkalies given indefinitely, particularly in large amounts, may do much harm by irritating the stomach and by causing alkalosis. Probably calcium carbonate is the least injurious alkali to be given continuously, as it acts only in the presence of a free acid. Chewing gum may increase saliva and so decrease gastric acidity. Belladonna and its preparations may relax spasm of the pylorus and so tend to regulate peristalsis. Administration of a purgative sometimes produces an irritant effect which tends to raise the rate of contraction in the upper segments of the gastro-intestinal tract, according to Alvarez, and so re-establish the gradient.

Pure gastritis without ulcer or caustic chemical irritant is an infrequent and indefinite lesion. Some pathologists doubt if it ever occurs. Derangement of the motor mechanism is quite common. One of the best principles for treatment is the old principle of rest, emphasized by Hilton sixty-five years ago, and rest means avoiding function as far as possible. If, then, we find that proteins stimulate both the peristalsis and the secretion of the stomach, it is best to reduce the intake of proteins. Carbohydrates and fats are not at all affected by the gastric juice. By balanc-

ing the diet so that the intake of food will be no more than is necessary to maintain life and by giving the stomach as little work as possible we may establish rest. The protein of milk is less stimulating than meat proteins. Water has but little effect upon the stomach. Arrangement of the diet, arrangement of work, and arrangement of the psychic and toxic influences so as to lessen the burden on the stomach are the main factors, then, in the treatment of this condition.

As for surgery for organic gastric diseases, the object should be to remove the pathology as far as possible and to restore physiology when it can be done. Peptic ulcers in their early stages should, as a rule, be treated medically by a diet so regulated as to give the stomach as much rest as possible. This cannot be done unless the patient is in bed, because when the patient is about he requires more food and so gives more work to the stomach. If a gastric ulcer does not heal in a few months, particularly because gastric ulcers tend to become cancerous, a partial gastrectomy should be done and the stump of the duodenum united to the stump of the stomach along the lesser curvature. Duodenal ulcers that are refractory to medical treatment may be dealt with surgically by pyloroplasty, a gastro-enterostomy, or by excision, depending upon the kind, size, and location of the ulcer. After any surgical operation on the stomach, however, the patient should have medical treatment for several months.

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Dr. John Wesley Long, Greensboro:

Mr. President, I feel that I voice the sentiments of this body when I say that in the splendid addresses of our distinguished guests, Dr. Robinson and Dr. Horsley, and of our own Dr. Crowell, we have reached the peak of our effort for the scientific output of this session. Therefore, I move a rising vote of thanks to these gentlemen for the splendid papers they have given us.

This motion was seconded and carried unanimously.

The evening session then adjourned. Immediately after adjournment, a moving picture entitled "Tuberculosis" was shown.

THIRD GENERAL SESSION

WEDNESDAY, JUNE 16, 11:30 A. M.

Dr. William deB. MacNider, President, in the Chair.

The Society met in the Convention Room of the Oceanic Hotel, and was called to order by the President, who stated that the purpose of the meeting was the nomination of members of the State Board of Medical Examiners.

The President appointed the following tellers: Dr. Chas. O'H. Laughinghouse, Greenville; Dr. W. P. Holt, Duke; Dr. Carl V. Reynolds, Asheville; Dr. D. T. Tayloe, Jr., Washington; Dr. J. G. Murphy, Wilmington; Dr. W. M. Coppridge, Durham.

The following candidates were nominated:

Dr. Foy Roberson, Durham, by Dr. Hubert A. Royster, Raleigh. Seconded by Dr. R. L. Felts, Durham, and by Dr. Carl V. Reynolds, Asheville.

Dr. Paul H. Ringer, Asheville, by Dr. C. H. Cocke, Asheville. Seconded by Dr. J. W. Dickie, Southern Pines, and others.

Dr. C. S. Lawrence, Winston-Salem. Seconded by Dr. J. T. Burrus, High Point.

Dr. H. D. Walker, Elizabeth City, by Dr. Charles O'H. Laughinghouse, Greenville. Seconded by Dr. C. E. Moore, Elm City, and Dr. J. L. Spruill, Jamestown.

Dr. L. B. Evans, Windsor, by Dr. J. M. Northington, Charlotte. Seconded by Dr. V. M. Hicks, Raleigh.

Dr. J. K. Pepper, Winston-Salem, by Dr. William Allan, Charlotte. Seconded by Dr. W. H. Sprunt, Jr., Winston-Salem, and by Dr. F. R. Taylor, High Point.

Dr. R. S. McGeachy, Kinston, by Dr. J. C. Rodman, Washington. Seconded by Dr. Hubert B. Haywood, Jr., Raleigh, and by Dr. W. E. Evans, Rowland.

Dr. W. Houston Moore, Wilmington, by Dr. Cyrus Thompson, Jacksonville. Seconded by Dr. Edward J. Wood, Wilmington, and Dr. W. C. Galloway, Wilmington.

Dr. J. W. MacConnell, Davidson, by Dr. Oren Moore, Charlotte. Seconded by Dr. L. G. Beall, Black Mountain.

Dr. J. R. Parker, Burlington, by Dr. A. A. Kent, Lenoir. Seconded by Dr. C. O. Abernethy, Raleigh.

Dr. T. W. M. Long, Roanoke Rapids, by Dr. John B. Wright, Raleigh. Seconded by Dr. H. L. Sloan, Charlotte; Dr. Cyrus Thompson, Jacksonville, and Dr. Carl P. Parker, Seaboard.

Dr. J. R. McCracken, Waynesville, by Dr. J. Howell Way, Waynesville.

Dr. R. L. Pittman, Fayetteville, by Dr. W. D. James, Hamlet. Seconded by Dr. J. W. Halford, Lillington.

Dr. J. E. S. Davidson, Charlotte, by Dr. J. M. Baker, Tarboro.

Dr. W. W. Dawson, Grifton, by Dr. Grady G. Dixon, Ayden. Seconded by Dr. Charles O'H. Laughinghouse, Greenville, and Dr. James M. Parrott, Kinston.

On motion, duly seconded, the nominations were closed.

After announcements by Dr. Murphy, Chairman of the Committee on Arrangements, Dr. L. B. McBrayer, Secretary, read telegrams from Dr. J. V. McGougan, Fayetteville, and Dr. H. Thompson Frazer, Asheville, expressing regret at their inability to be present.

The general session then adjourned.

FOURTH GENERAL SESSION

WEDNESDAY, JUNE 16, 2:30 P. M.

DR. WILLIAM DEB. MACNIDER, President, in the Chair.

The Society met in general session in the Convention Room of the Oceanic Hotel, and was called to order by the President. This meeting was for the purpose of electing members of the State Board of Medical Examiners.

The first ballot resulted as follows:

Dr. Foy Roberson	206	(Elected)
Dr. Paul H. Ringer	181	(Elected)
Dr. C. S. Lawrence	70	
Dr. H. D. Walker	65	
Dr. L. B. Evans	107	
Dr. J. K. Pepper	106	
Dr. R. S. McGeachy	38	
Dr. W. Houston Moore	216	(Elected)
Dr. J. W. MacConnell	197	(Elected)
Dr. J. R. Parker	75	
Dr. T. W. M. Long	186	(Elected)
Dr. J. R. McCracken	80	
Dr. R. L. Pittman	128	
Dr. J. E. S. Davidson	19	
Dr. W. W. Dawson	199	(Elected)

(274 votes cast; 138 necessary to elect.)

Dr. C. S. Lawrence withdrew in favor of Dr. J. K. Pepper, and Dr. J. E. S. Davidson withdrew.

On the fourth ballot Dr. J. K. Pepper was elected as the seventh member of the Board.

Dr. K. P. B. Bonner, secretary of the retiring board, in behalf of the retiring board invited the newly elected board to meet with them in the conduct of the coming examinations in Raleigh.

The general session then adjourned.

FIFTH GENERAL SESSION

WEDNESDAY, JUNE 16, 9:00 P. M.

DR. WILLIAM DEB. MACNIDER, President, in the Chair.

The Society met in general session immediately following the adjournment of the House of Delegates, and was called to order by the President.

MEMORIAL EXERCISES

The following report of the Committee on Obituaries was presented by Dr. E. G. Moore, Chairman, who read the names of the deceased physicians and also the obituaries prepared as a part of the report.

NORTH CAROLINA DOCTORS WHO HAVE DIED DURING THE YEAR*

Name	*Address*	*Date of Death*
[1]Abernathy, Henry L.	Hickory	May 15, 1925
[1]Abernethy, J. S.	Charlotte	
[1]Anderson, Abel	Denton	October 14, 1925
[1]Armfield, Romulus	Marshville	November 23, 1925
[1]Ashe, Edmund Strudwick	Wadesboro	May 24, 1925
[1]Booth, Thomas L.	Oxford	January 25, 1926
Browne, Arthur Thompson	Winston-Salem	July 18, 1925
[2]Burnett, Ovid V.	Shelton Laurel	November 16, 1925
[1]Carter, George Hill	Lenoir	April 12, 1926
[1]Croom, A. Bascom	Maxton	June 15, 1925
Crowell, Gordon Bryan	Lincolnton	May 9, 1926
[1]Crowson, Samuel T.	Taylorsville	January 5, 1926
[2]Crumpler, E. L.	Merry Hill	February 20, 1926
Edwards, Grandison C.	Hookerton	May 7, 1926
Honorary Fellow		
[1]Falls, Benjamin Franklin	Kings Mountain	February 2, 1926
[1]Fitzgerald, Jesse York	Indian Trail	
[1]Flippin, Robert E. L.	Pilot Mountain	September 1, 1925
[2]Foster, G. A.	Liberty	October 22, 1925

*This list includes the names of some physicians who had died previous to the period covered, but whose deaths had not heretofore been reported in the TRANSACTIONS.

[1]Formerly a member of this society.

[2]Non-member.

Name	*Address*	*Date of Death*
[2]Fox, A. C.	Creswell	
Fox, Millard Fillmore Honorary Fellow	Guilford College	August 15, 1925
[2]Gilman, Willard Biddle	Lakeview	February 13, 1925
[1]Guinn, L. E.	Waxhaw	
Hammack, John C.	Walkertown	May 15, 1926
Harris, John Henry	Franklinton	June 13, 1925
Hart, Edward Roland	Wilmington	
Hill, David Joseph	Lexington	
House, Wooster Hassell	Goldsboro	January 3, 1926
[1]Johnston, R. H.	Wilson	
Jones, C. M.	Grimesland	May 26, 1926
Jones, John Walter	Boone	January 14, 1925
[1]Joyner, Thaddeus O.	Severn	March 21, 1925
[1]Kellum, B. E.	Jacksonville	
[2]King, David D.	Greensboro	April 21, 1925
[1]Ledbetter, Arthur Erastus	Greensboro	June 2, 1925
Leggett, Kenelm Honorary Fellow	Hobgood	September 20, 1925
Linney, Romulus Z.	Charlotte	January 20, 1926
Long, Benjamin L. Honorary Fellow	Hamilton	April 29, 1926
[1]McCanless, Walter L.	Danbury	May 27, 1925
[1]Macon, Philemon J.	Warrenton	December 27, 1925
Monroe, William A. Honorary Fellow	Sanford	February 26, 1926
Moorer, M. P.	Asheville	November 3, 1925
Moseley, Herbert Pennell	Farmville	August 20, 1925
[1]Nance, George B.	Monroe	
[1]Nicholson, William G.	Harmony	May 20, 1925
[1]Palmer, B. H.	Shelby	
Pharr, William Watson Honorary Fellow	Charlotte	July 4, 1925
Phillips, Mathew Dalton Honorary Fellow	Dalton	December 20, 1925
[1]Powers, John Benjamin, Sr.	Wake Forest	December 31, 1925
Ray, Hickman	Durham	October 17, 1925
Roberson, George Beard	Greensboro	June 24, 1925
Robinson, Frank	Lowell	June 14, 1923
[2]Seawell, Virgil N.	Faison	April 1, 1926
Simmons, John O.	Charlotte	April 13, 1925
Sloan, James M.	Gastonia	February 19, 1926
Sumner, William I.	Randleman	May 6, 1926
[2]Thompson, Fred	Pinebluff	

[1]Formerly a member of this society.
[2]Non-member.

Name	*Address*	*Date of Death*
Tull, Henry	Kinston	May 20, 1926
Honorary Fellow		
Turner, James Monroe	North Wilkesboro	Oct. 18, 1925
Whitehead, John	Salisbury	April 15, 1926
Honorary Fellow		
[1]Williams, Thomas Barker	Ridgeway	
[1]Woltz, John R.	Dobson	
[1]York, Nelson Durant	Mebane	February 25, 1926

REPORT OF COMMITTEE ON OBITUARIES

"Leaves have their times to fall,
And flowers to wither at the north wind's breath
And stars to set—but all,
Thou hast all seasons for thine own, O death."

We have met once more to pay a tribute of respect to the memory of our dead, those of our comrades who marching along through the span of years have fallen by the wayside and now sleep the everlasting sleep. There has been an unusual toll during the past year, comprising those who have recently entered the ministry of service and those of virile strength and seasoned years, as well as those who in the mellow days of a serene twilight have crossed beyond the tide of stress and storm and anchored safely on the other shore. Some of these were personally unknown to me, but some were my friends of the long ago, whose faith and trust never slackened; but all were our brethren, who did their bit in the warfare against the unconquered enemy of mortal kind and mortal life. Death, man's grim foe and insatiate enemy, stalks in the broad daylight and searches through all the shadows of the night giving no heed to the prattle of infant voices; with no pity for the paintive cry of merry youth, full of hope and promise, nor the strong voice of vigorous manhood, nor even the pathetic appeal of the weak and aged as with tottering footsteps they stumble in the last lap of the journey of life. Those whose mission it is to minister in the trying hours of mortal combat, that health may be restored and death averted, may find a sweet compensation in rendering this humane service, only to be reminded that some day and in some way death will win the victory over all.

It is a fundamental fact that we are born to die, but in the plan and providence of God the opportunity is given every man to so live in service to and fellowship with his fellows that the memory of his good deeds will follow him long years after the dark portals of the grave have claimed their own. No profession offers a greater field of service than ours, none demands more of patient toil or more of willing sacrifice, and none in the great judgment-day will have a larger meed of honor than will be the glory of the faithful doctor, who went about doing good in rightful spirit, in service to his fellow-man, and in the holiness of this service did serve his Lord. May those of us who yet remain in the flesh as beneficiaries of the joy and purpose of life be constrained therefore to

[1]Formerly a member of this society.
[2]Non-member.

"So live, that when thy summons comes to join
The innumerable caravan, that moves
To that mysterious realm, where each shall take
His chamber in the silent halls of death,
Thou go not, like the quarry-slave at night,
Scourged to his dungeon, but, sustained and soothed
By an unfaltering trust, approach thy grave
Like one who wraps the drapery of his couch
About him, and lies down to pleasant dreams."

(Signed) E. G. Moore, *Chairman*
J. T. J. Battle,
W. M. Coppridge,
Committee.

Dr. MacNider, President:*

This part of the meeting is, of course, one of the saddest parts of it, and yet it is one of the best parts of it. It is pretty easy to look forward; almost anyone can do that; but it is right difficult sometimes to look back and think about what has happened, about individuals that have happened and gone, and that is what we are doing tonight. I hope any member of the society present who desires to make any statement about any member of our profession who has died during the last year will take opportunity to do it. There are several men that I wish I could make some statement about, but I just can not do it; I do not know how to do such things. When I heard the names of men such as Gordon Crowell and Hickman Ray and W. H. House, men like that, whom I taught, who were square and clean and hard-working, and had slipped away, I was glad this time had come, so that I could just sit here and think about them for a moment. At the other extreme of age and the last name on the list was Dr. John Whitehead. I did not know him intimately, as I did his brother, Dr. Richard Whitehead, who virtually raised me; but you did not have to know Dr. John Whitehead in an intimate, tangible fashion to know him. You do not have to know things of the spirit in an intimate and tangible fashion, and certainly Dr. John Whitehead was of the spirit. The few times I came in his presence I knew there was something there that I knew very little of; it was something that overpowered me, for I knew it was right and good and sweet; and I knew that something was God.

ABEL ANDERSON, M. D.

The subject of the sketch, Dr. Abel Anderson, was born in Davie County, February 27, 1856. He began the practice of medicine in Davidson County in the year 1879 and died at his home in Denton on October 14, 1925, at the age of nearly seventy, having been a practicing physician for forty-six years. Dr. Anderson was a physician of the old school, well grounded in the fundamentals of modern medicine. He spent his life as a country doctor, often achieving success in the face of discouraging handicaps. He was dowered with common sense combined with rich human sympathy.

*Remarks made during the presentation of the report.

"Some are born great, some achieve greatness, and some have greatness thrust upon them." Some men impress us by their power of speech, but others go silently at their tasks seeking neither the plaudits of the multitudes nor praises from the elect, and we are bound to pay the tribute of admiration to the results of their patient labors. Biographers often record the words and recount the deeds of so-called great men for the reason that these are so obvious, but after all such greatness is often a mere reaction to a set of circumstances. Crises never create character; they reveal it. There can be no real greatness without greatness of soul. In the past we have erected monuments to the men who have in the name of patriotism and under the sanction of war been the destroyers of human life and too often have forgotten the healers who followed in the wake of battle and sought to lessen suffering and lengthen human life. As the world pays honor to the unknown soldier, let us as members of the medical profession not forget to yield the tribute of a passing thought to the undying heroes who waged war against disease and death. Greatness of soul speaks in the still, small voice and builds its temples as Solomon erected the temple of the Lord, without the sound of hammer, axe, or any tool of iron.

"Greatness lies insphered in silence,
Littleness to sound is stirred,
All the grandest things in nature
Never have been seen or heard.
Proving down by printless logic,
All the science of the school,
Silence is the law of being,
Sound the breaking of the rule."

Greatness of soul is possible only to those who have the power of discernment, whose eyes look beyond the gorgeous trappings of time and the pomp of human display and, catching sight of the "vision splendid", rest contented in the things that are immutable and eternal.

Such was Doctor Abel Anderson. Night and day, year after year, he strove heroically to relieve suffering, to prevent disease and to beat back the tide of superstition and ignorance and thus make easier the task of those who should come after him. Verily his life was an inspiration and his memory is a benediction.

Whereas our older brother and friend has been called from our midst, and whereas we delight to honor his memory and desire that some permanent record of his splendid devotion to a worthy cause be made as an example and an inspiration to his successors, therefore be it resolved that this brief account of his life be recorded in the minutes of the Davidson County Medical Society.

Chas. R. Sharp, *Chairman.*
J. E. Hobgood, *President.*
G. C. Gambrell, *Secretary.*

EDMUND STRUDWICK ASHE, M. D.

Dr. Ashe was born in Wadesboro, N. C., March 29, 1858, the son of Dr. E. F. Ashe and Flora Howze Ashe, and died May 24, 1925.

It was customary at the time he began to study medicine for the young men to "read" under some preceptor, which custom had many advantages, so in keeping with the times he began his chosen profession under his father. He graduated from the College of Physicians and Surgeons of Baltimore in 1885, was licensed by the State Board of Medical Examiners the same year and began active practice at once. Dr. Ashe practiced in the town in which he was reared, and the success which he achieved in his profession proved that he had the respect and confidence of the people during his entire life.

His personal magnetism won him hosts of friends and inspired his patients to the extent of willingly placing their lives in his hands. The hold he had upon his patrons was remarkable. There are many families in Anson County who never had another physician. Being the son of his father, who had such an enviable reputation as one of the leading practitioners of the state, and named after Edmund Strudwick, a splendid and gifted physician who was for a while associated with his father in Wadesboro, Dr. Ashe had the right by inheritance, and emulating the one for whom he was named, to become one of those gentle yet strong and efficient general practitioners who so well serve the community in which they live. This class of doctors is passing away, but they are sadly missed and very much needed.

Dr. Ashe married Miss Cornelia Wall, daughter of Major James M. Wall and wife of Wadesboro, who with her two daughters, Misses Helen and Flora, survives him.

J. T. J. Battle, M. D.

THOMAS L. BOOTH, M. D.

Dr. Thomas L. Booth, aged sixty-four, died at his home in Oxford, January 25, 1926, after an illness of four years. He was a native of Granville County, where he spent his entire life, being one of the best beloved physicians in that county. He was the son of Dr. J. W. Booth, of Granville County, and Annie Lynch Booth. Dr. Booth was a Mason and was attending physician to the Oxford Orphanage. He is survived by a widow, formerly Miss Irene Grimesly of Snow Hill, and four children.

GEORGE HILL CARTER, M. D.

Dr. George Hill Carter was born at the home of his grandfather, Catlet Jones, in the Happy Valley, Caldwell County, N. C., May 14, 1855. He was the son of Dr. George Nicholas Carter, who came to North Carolina from Virginia, being a direct descendent of Robert Carter of Shirley known as "King Carter". His mother was Julet Jones of Happy Valley. He was known by relatives and friends as "Hill". His boyhood days were spent on his father's farm, attending school nearby, and in early manhood he attended school in Winston-Salem. Here he afterwards worked in a store and read medicine, working during the day

and reading at night and reciting to the late Dr. Henry Bahnson. Later he attended lectures at Louisville, Ky., and at the University of New York, where he graduated in March, 1877, with the highest honors. He began practicing medicine with his father but after two years moved to Rockingham County, where he married Miss Nannie Mildred Kallam on April 5, 1882. He soon returned to his former home in Caldwell County, and took over the work of his father, who was retiring. Dr. Carter had the keenest appreciation of and devotion to his beautiful mountain home and its surroundings, preferring to live, work, and die among the friends of his childhood. When solicited to seek a more inviting and lucrative location his reply was, "No, no, I'm not going to leave the valley and mountains I love and the people who know and understand me."

Dr. Carter practiced for forty-seven years, going most of the time on horseback. He labored on until February, 1923, when he rode his faithful old horse in for the last time and had to be lifted off by his son.

He died on April 12 at eleven-fifteen A.M., after having had a fourth stroke of paralysis, and was buried on the fourteenth at Moriah Chapel. The funeral services were conducted by the Reverend Hugh Dobbin, of Ledgerwood, and the Reverend Mr. Barber, of Taylorsville, assisted by the Masons of the Hibriten Lodge. His wife and three children survive: George Kallam, D. D. S., Taylorsville; Mrs. Virginia Carter Coppage, who lives at the old home with her mother, and Randolph, who lives at Elkville.

It can be truly said of him, "The good old faithful country doctor has gone." Dr. Carter was not only a fine physician but a splendid Chirstian. He left no fortune to his wife and children, really dying a poor man, but he left them an imperishable inheritance in the irreproachable life he lived and the good he did for his fellow men.

GORDON B. CROWELL, M. D.

Dr. Gordon Bryan Crowell, a prominent and brilliant young surgeon who was associated with his father, Dr. L. A. Crowell, in the operation of the Lincolnton Hospital, died at the institution May 9, 1926. He was born and reared in Lincolnton, graduating from the pubilc schools there and later from the University of North Carolina and the University of Pennsylvania. He served with the Medical Corps of the United States Army in France during the World War. He was the pride of his father, who had associated him on the surgical staff in the Lincolnton Hospital, in which position he gave promise of much prominence in his profession. His passing away in early life casts gloom upon the community which he served and causes much sorrow among the profession, who esteemed him for his worth.

GORDON BRYAN CROWELL, M. D.

"He saved others; himself he cannot save". This utterance, spoken in derision of the Son of Man by his enemies at the moment of His supreme sacrifice to save the human race, was in fact as fine a eulogy of the

Savior of the world as was ever spoken by man. He could not save the world without sacrificing SELF, and therefore He obliterated SELF voluntarily in order that sinful man might live. Dr. Gordon Crowell, like the Savior in whom he trusted implicitly, crowded a full, rounded life into a few short years. Like the Christ whom he followed with a beautiful childlike faith, he gave himself literally in service to humanity.

Dr. Gordon Bryan Crowell was born in Lincoln County, North Carolina, August 14, 1895, and died in Lincolnton, N. C., on Sunday, May 9, 1926. The son of Dr. L. A. Crowell and Mary Hull Crowell, Gordon Crowell was a scion of as fine a stock of ancestry, both paternal and maternal, as ever lived in piedmont North Carolina. With such a heritage it is but natural that he lived a fuller life in his short span than most men do in long years. As we think of him now we value his life as one of the most beautiful and useful that has in our day been projected into the community in which we live. Though short in years, in the deeper sense it was a full life, lived in the spirit of unselfish devotion to duty and service to humanity, self-sacrificing, with a passion to serve, and with a vision and an ideal high above the plane of ordinary, sordid, selfish living. In a day when selfishness, greed, intolerance, and bitter hate have taken such strong hold upon the lives of men, this altruistic young life is a shining example for the youth of the state to strive to emulate. He fell, face to the front, in the midst of the great battle of life, striving valiantly to serve others worthily, forgetful of self. How noble!

Gordon Crowell was an educated man. He was graduated from the University of North Carolina with high honors, taking the A. B. degree. He received his professional education at the Universities of North Carolina and Pennsylvania, from which latter institution he received his degree in medicine. After leaving college he took several special courses of professional training in order to equip himself for efficiency in his profession, and in 1922, after finishing his medical education, associated himself with his father, Dr. L. A. Crowell, in the management of Lincoln Hospital, Lincolnton. From the very beginning Dr. Crowell took high rank in his profession, and he was appraised as one of the most promising of the younger physicians and surgeons of western North Carolina.

In 1921 Dr. Crowell married Miss Frances Geitner, of Hickory, N. C., a member of one of Catawba County's most substantial and honored families. The devoted young wife and two children—little Frances, aged three, and the other, *en ventre de sa mere*—survive, together with the father, mother, two brothers, and two sisters.

Deeply interested in public and civic affairs, Dr. Gordon Crowell was an active supporter of every movement in his community looking toward moral, civic, and industrial improvement and development. He was especially active as a member and leader of the Kiwanis Club.

Of Christian parentage and himself a Christian, Gordon Crowell while yet a boy joined the First Methodist Church of Lincolnton. He was loyal to his church and to his Christ, in Whose cause he was actively enlisted as a faithful soldier. He was an active and honored member of the Board of Stewards of his church, and the power of his influence was exerted for the religious uplift of his community.

One so full of love for his fellow men and so devoted to duty and service was, of course, a loyal patriot. Dr. Gordon Crowell served his country during the World War, in line of duty, being a member of Hospital Unit O, over-seas.

The life of Gordon Bryan Crowell was a well rounded, finished life, lived nobly and well. He was loved where he was known by all those who prize the pure and the beautiful and the good and cherish integrity of character.

(Signed) Chas. A. Jones, M. D.

GORDON BRYAN CROWELL, M. D.*

By the untimely death of Dr. Gordon Crowell at Lincolnton, May 9, 1926, the medical profession of our state has lost one of its most promising young members.

Gordon was born in 1895, the eldest son of Dr. Lester A. Crowell and Mary Hull Crowell. He was educated in the schools of Lincoln County, entering the University of North Carolina in the fall of 1912. Here he took his bachelor's degree in 1916, and had finished the first year of his medical studies when this country went into the war. In the spring of 1917 he enlisted in Hospital Unit O, and sailed for France in February, 1918, serving for the next year with Base Hospital No. 6 at Talence. Gordon carried out his share of the work there faithfully and conscientiously, and because of his interest in medicine and his quiet efficiency he was assigned work in the Laboratory of Base Sector No. 2. After the close of hostilities, because of his splendid record, he was permitted to return home ahead of his organization, so that his medical education would be interrupted as little as possible. He received his doctor's degree at the University of Pennsylvania in 1922, and the same year entered practice with his father in Lincolnton. In June, 1921, he was married to Miss Frances Geitner, who, with a little daughter, Frances, survives him.

Dr. Crowell's classmates speak in the highest terms of his work in school, and all of us who knew him in practice realized not only the bright future before the young man himself but also how fortunate the people of his county were in having settle among them a man with Gordon's training and equipment for medical work and a man endowed with such sound common sense, mature judgment, and splendid character. His patience under the trials and dangers of military service, his steadfast optimism, and remarkable unselfishness endeared him to all who came in contact with him. In his death we lost one of the chief blessings of this life—a sincere friend.

"For some we loved, the loveliest and the best
That from his Vintage rolling Time hath prest,
Have drunk their Cup a Round or two before,
And one by one crept silently to rest."

*Obituary filed after the annual meeting for publication in the Transactions.

Dr. Benj. J. Lawrence, Raleigh:*

Mr. Chairman, you mentioned my friend and your friend, young Gordon Crowell, who passed away while still so young. His father is not at this meeting. He is an honored member of this Society and of the Board of Medical Examiners. I should like to move that the secretary be instructed to send him a telegram of regret and sympathy at this time.

This motion was carried, and the telegram was sent by the secretary.

Dr. E. A. Abernethy, Chapel Hill:*

I should like to say a word about Gordon Crowell. It was my pleasure to know him at the University as a student and as an interne in the Infirmary. He was a lovely boy, of strong character and of great promise. Two weeks ago I saw his father and mother. The mother, of course, is heartbroken, and the father is absolutely crushed. Gordon had a brilliant mind, was a thorough student, and was just entering upon a wonderful career. After his graduation he went back to Lincolnton, where the father had built a beautiful hospital and was getting ready to drop his mantle on Gordon's shoulders. The sudden ending of this promising usefulness is one of the mysteries the Master has not re-revealed, and we bow to that Superior Wisdom.

SAMUEL T. CROWSON, M. D.

Dr. Samuel T. Crowson, Taylorsville, died January 5, 1926. Dr. Crowson was forty-eight years of age and had been a practitioner of medicine in Alexander County for more than twenty years. He had been County Health Officer for a number of years and had represented Alexander County in the legislature. He was active in business affairs and was a leader in every movement for the advancement of his county and community. His sudden death, caused by an attack of angina pectoris, was a great shock to the people of his county.

GRANDISON C. EDWARDS, M. D.

Dr. G. C. Edwards, of Hookerton, aged sixty-eight, died at his home at midight, May 7, 1926. Dr. Edwards had been in failing health for three months. He had practiced medicine in the vicinity of Hookerton for forty-five years and was esteemed as a good citizen and a good doctor.

BENJAMIN FRANKLIN FALLS, M. D.

Dr. Benjamin Franklin Falls, aged seventy-one, died at the home of his daughter, Mrs. Horace M. Houser, Kings Mountain, February 2, 1926. Dr. Falls had been in failing health for three years, and his death was due to a stroke of paralysis sustained a few days before. He practiced medicine for fifty years and was a successful physician.

*Remarks made during the presentation of the report.

G. A. FOSTER, M. D.

Dr. G. A. Foster, a prominent citizen as well as a beloved physician, died at his home at Liberty, October 22, 1925, at the age of sixty-nine years. He leaves one daughter, Mrs. J. D. Gregg, of Alamance County.

MILLARD FILLMORE FOX, M. D.

Dr. M. F. Fox, of Guilford College, was born in Randolph County in 1852 and began the practice of medicine in 1880. He was a member of the Guilford County Medical Society and in his younger days enjoyed a large practice in his section of the county. He died at Norfolk, Va., on August 15, 1925.

JOHN HENRY HARRIS, M. D.

Dr. John Henry Harris, the son of Robert Harris and Lucinda Winston, was born May 18, 1863, in Wake County, N. C. His father died when he was quite young. He graduated from Wake Forest College in 1882, and then attended medical lectures at Bellevue Hospital Medical College, graduating in the class of 1884. He practiced his profession in Wake County for a short time but in 1886 came to Franklinton and formed a partnership with Dr. Walter Cooke, which lasted until the death of Dr. Cooke in 1889. He continued practicing alone until 1901, when he wanted me to become his partner, and this arrangement lasted until his death. In 1890 he married Miss Lula Timberlake, daughter of the late J. P. Timberlake, Sr., of Franklin County. Of this union two children were born, John Henry, Jr., and Martha Timberlake.

Dr. Harris was a fine physician and a natural surgeon. Had he devoted himself to that branch of the profession, he would have attained eminence. He loved his profession and was a good diagnostician and therapist. He was very successful in his work and had the confidence and affection of his patients to a greater extent than any other doctor I ever knew. He passed away June 13, 1925, at the Sarah Leigh Hospital, Norfolk, Va., leaving a brother, son, and daughter, and a host of relatives and friends to mourn their loss.

R. B. Henderson, M. D.

JOHN HENRY HARRIS, M. D.

The death of Dr. J. H. Harris of Franklinton, N. C., removes from that section a man whose place can hardly be filled. While others may take up the work which he left behind and will, no doubt, carry it on faithfully and effectually, yet it is scarcely possible for anyone to enter so fully into the hearts and homes of the people as did Dr. Harris.

Coming to Franklinton about thirty-eight years ago, when there were three older doctors already in the town, Dr. Harris associated himself with one of them and literally devoted his life to the service of the sick in that vicinity. He was ready, able, conscientious, untiring. He was also clean in his thinking, strong in his convictions, and straight in his dealings. Further, he was of a jovial disposition, friendly, humorous and

companionable; but he was quick to call a foul or to challenge a wrong. Most of his former friends and patients will remember Dr. Harris chiefly for his kindness and his personal interest, and this is well. So do we all who knew him. But I am thinking of him, too, as a competent physician, far above the average of his time and station; one who kept himself abreast of his profession, who was not too busy to learn how to do better, who went away every few years to receive post-graduate instruction and to attend clinics, who studied his cases and bestowed intelligent care upon his patients. Moreover, he was possessed of a natural surgical instinct, and if conditions had permitted he could have developed into a gifted surgeon.

As a physician, a citizen, a friend and a father this man left upon his community a strong and beneficent impress which will not fade.

Hubert A. Royster, M. D.

WOOSTER HASSELL HOUSE, M. D.

The Wayne County Medical Society met last night, January 15, 1926, at 7:30 o'clock in the Community Memorial Building, Dr. W. C. Sutton presiding. The usual program of reading papers was omitted, the meeting being in the nature of a memorial to our late confrere, Dr. W. H. House. Members of the society paid tribute to his memory, and letters were read from several of his former patients expressing tender and loving appreciation. Someone has said, and it seems to us a comforting and simple truth, that "What we call death is but the drawing aside of a curtain and stepping across the threshold into a new and beautiful life", and so

"When the sun in all his state
Illumed the eastern skies,
He passed through glory's morning gate
And walked in paradise."

Dr. House was born in Pitt County, North Carolina, on August 7, 1891, and died January 3, 1926. He was the son of Gregg T. and Melissa House. In the early days of the World War Dr. House tendered his service to the United States Government, he then being located at Oak City, Martin County, where he did general practice. Within a few months he was sent overseas and loaned to the English Government, in whose service later he won renown by his gallant conduct. He measured up to the full stature of a high class medical officer and both deserved and won the confidence of his superiors, with the result that he was awarded several medals for heroism, being decorated by the King of England in person. At the close of the War he entered a post-graduate medical school and devoted two years to the special study of obstetrics and pediatrics. Locating in Goldsboro October 15, 1921, for the practice of his profession and specialty, he immediately affiliated with the Wayne County, Fourth District, and State Medical Societies. He was secretary of the Wayne County Medical Society in 1923 and president of the Fourth District Medical Society in 1925. On September 26, 1923, he was happily married to Miss Margaret Darden of this city, who was a great helper to him in his work. Remembering his hardships as a

soldier, he did not forget the World War veterans. With unfailing cheerfulness he lightened their burdens and helped to lift their cares and make their hearts glad, being at the time of his death the local medical director of the Veterans' Bureau.

Dr. House loved the medical society, and nothing pleased him more than meeting with his fellow practitioners and discussing some phase of practical or scientific medicine. He was strictly ethical in his practice, which was pleasantly mentioned in short talks made by Drs. Ivey, Johnson, Henderson, Strosnider, T. M. Bizzell, and others last night.

"Strength and delicacy spring from the same source. The heart that can flame is the heart that can love, so at a thousand points of sweet memories there survive the returns upon a capital of devotion lying at interest in the hearts of his friends."

(Signed) A. G. Woodard, M. D.
Secretary Wayne County Medical Society.

Dr. O. C. Daniels, Oriental:[1]

I want to speak a word about Dr. House. Probably very few men here know much about him. I did not know him very well in the first part of his practice, but I am informed that he was in the American army during the World War, was known to the officers of the American Army and of the British Army, and fought in the first line trenches during the whole war. He was very highly regarded; in fact, so highly regarded that he dined with the King and Queen of England. He was one of the best-read men I have ever known, and a man of very high character. He practiced medicine for the sake of humanity. Dr. House was a very young man, apparently in the bloom of health, and died very suddenly. It was a shock to everybody in Wayne County. I was away at the time, and it was a great shock to me. I knew him quite well, for he had an office next to mine. To know him was to love him.

C. M. JONES, M. D.

Dr. C. M. Jones, of Grimesland, Pitt County, died May 26, 1926, as a result of injuries received by being struck by an automobile while on his way to church. Dr. Jones was one of the most beloved citizens of Pitt County and held in high esteem and respect by people of all walks of life. His taking away brought great grief to the people of his community, whom he had served so faithfully and so well.

ARTHUR ERASTUS LEDBETTER, M.D.[2]

Dr. Arthur E. Ledbetter was born October 26, 1860, at Jamestown, Guilford County, N. C. His parents belonged to the denomination of Friends, and Arthur Ledbetter was educated in the public school at Jamestown and at New Garden School, now Guilford College. He taught school for a short time, until his mariage in October, 1884, to Miss Rhoda Elliott. Soon after his marriage he began the study of medicine with Dr. Wm. Bradshaw, and graduated from the University of Mary-

[1]Remarks made during the presentation of the report.
[2]Memorial adopted by the Guilford County Medical Society August 14, 1925.

land in April, 1888. He was licensed by the Board of Examiners in the same year and joined the State Medical Society. In August, 1888, he began the practice of his profession in Caswell County, and two years later moved to Greensboro, where he continued in active general practice until attacked by the disease which caused his death. In 1898 he was elected Superintendent of Public Health of Guilford County, which position he held for two years.

Dr. Ledbetter was quiet and unassuming in manner, but speedily won the hearts of all who were privileged to know and appreciate him and had the esteem and affection of all his patients. He was fond of reading and study and had a large store of general information always ready for use. He had written short biographical sketches of many of the physicians who had practiced or were practicing in Greensboro and Guilford County, some of which contain material which it would be hard to secure elsewhere today.

Dr. Ledbetter died June 2, 1925, from an attack of general progressive paresis, which began in September or October last year.

He was an earnest Christian, a diligent Bible student, and for years a teacher in Sunday school. He died as he had lived, in the hope of a glorious resurrection.

Whereas death has taken from us our esteemed friend and valued member, Dr. Arthur E. Ledbetter:

Resolved, that while we mourn his loss, we can only bow with submission to the will of our Heavenly Father.

Resolved, that this Society extends its heartfelt sympathy to the bereaved members of his family.

Resolved, that a copy of this paper be spread on our minutes and copies furnished to the press and to the family of Dr. Ledbetter.

ROMULUS Z. LINNEY, M. D.

Dr. Linney, of Charlotte, aged fifty, died January 20, 1926, from a stroke of apoplexy, soon after his return from a meeting of the Mecklenburg County Medical Society. He was the son of former Representative Linney of the eighth congressional district. Surviving him are his wife and one son, who bears his name and is now a medical student at the University of North Carolina. Dr. Linney, who was a specialist, was educated at Trinity College and Jefferson Medical College.

BENJAMIN L. LONG, M. D.

Dr. B. L. Long, of Hamilton, died Wednesday night, April 29, 1926, at his home after an illness extending over many months, the immediate cause of his death being heart trouble.

Benjamin Lafayette Long, son of Samuel Long and wife of Oak City, was born on April 8, 1852. He received his early education in private schools, afterwards taking a course in Massey's Business College in Baltimore. He then entered the University of Maryland in Baltimore, completing his medical course there four years later. He began practicing medicine in Hamilton in 1881, and in his forty-five years' experience

there he has been not only medical adviser but friend as well to every man, woman and child in his community.

Dr. Long was always active in promoting civic improvements and was for many years county commissioner. It was while he held that office that he was instrumental in having a law passed providing for improved roads from the county seat of Martin to the county seat of Halifax. He was an honorary fellow of the North Carolina State Medical Society and a charter member of the Martin County Medical Society. He was senior warden of the Hamilton Episcopal Church for years and in that capacity was a great support morally and financially to the church. He was an active Mason and Shriner and had been a leader in Masonic work in his community for years, being secretary of Conoho Lodge.

WILLIAM ARCHIBALD MONROE, M. D.

In the passing of Dr. William A. Monroe from this life the state at large lost one of its best citizens, the community in which he lived one of its most useful servants, and the medical fraternity one of its most valuable members and strongest men. The shock of his death was general, because he was much beloved. The doctor was a big man in every sense of the word, and as one of his close friends, who knew him well, stated: "He lived by the side of the road and was a friend to man."

Dr. William A. Munroe was born near Carthage, in Moore County, on April 18, 1863, and died at his home in Sanford early on the morning of February 26, 1926, after a brief illness which at first was thought not to be of a serious nature. He received his earliest medical education and his degree of doctor of medicine from the University of Maryland, at Baltimore, on March 17, 1886. After practicing for about one year near his old home, he went to Monroe, N. C., where he had charge of the sanitation and health of the railroad camps. The Seaboard Air Line Railway was being extended to Atlanta, Ga., at that time and Dr. Monroe went with the railroad forces to Marion and from there to the eastern part of the state, below Fayetteville. After his return to Moore County he was induced by the citizens of Waxhaw to locate in that town. He remained there for a period of about four years, coming to Sanford on May 2, 1894, where he continued to practice medicine up to the time of his death. Twenty years ago Dr. Monroe formed a medical partnership with his brother, Dr. John Monroe, and they owned the Central Carolina Hospital. The affection which the two brothers entertained for one another, as well as their devotion to each other, was indeed noteworthy, inspiring and beautiful.

On March 11, 1891, Doctor Monroe married Miss Elizabeth Stewart, daughter of the late John Millen Stewart of Monroe. With Mrs. Monroe there survive the following children: Mrs. W. A. Kellough, of Hamlet; the Misses Eoline, Lois, Susie, Betsy, Elsie and Mabel; and William A., Jr., and John, of Sanford. There are also one sister, Mrs. E. R. Morris, and two brothers, H. M. Monroe and Dr. John P. Monroe, and several nieces and nephews.

Dr. Monroe, with all his busy life, found time from his professional duties to serve his community, his state and all bodies politic for the

upbuilding and betterment of the community in which he lived. He represented Lee County in the legislature of 1923 with distinction to himself and the state at large. The writer recalls his successful and untiring activities in matters pertaining to the medical interests of the state and its people; how at this particular period of service, in his big, able way, he brought medical co-workers from all over the state so that the special legislative committees might receive all the essential facts for their enlightenment, that the people of the state might he made safe and protected against unwise and reactionary legislation.

Dr. Monroe was a fraternal man with a fraternal spirit. He was up to the time of his death a member of the Masonic order and its various branches, including the Commandery and the Shrine. His civic affiliated activities included The Sanford Commercial Club, The Chamber of Commerce, and the Rotary Club, of which he was a most representative member. He exercised the Rotarian spirit not only in fraternal and civic activities, always standing for the highest and best, but this Rotarian spirit permeated medical circles as well. Dr. Monroe was a fellow in the American Medical Association and The Southern Medical Association, and an honorary member of the State Medical Society. He was also an active member of his county and district medical society, as well of the Tri-State Medical Association.

Dr. Monroe represented a high type of Christian physician. He was a faithful and devoted member of the Sanford Presbyterian Church, in whose interest he was active, and in which he served for years as an elder. The funeral services were held in the Presbyterian Church, conducted by the pastor, Dr. R. C. Gilmore, assisted by Rev. D. M. MacNeill, of Cameron, a close friend and former pastor of Doctor Monroe's. There was a great outpouring of people from all walks in life, many of whom had traveled long distances to pay this last tribute of respect to the man whom they loved and honored during his life. Mr. MacNeill spoke of the strong friendship that had existed between the two from the time they were schoolmates. He said that "Dr. Monroe's Christianity was broader than his church, and he was a man of high ideals."

The last rites at the cemetery were in charge of the Masonic order and were most impressive, the work of putting away all that was mortal being done by the hands of men who had known him and who had loved him.

At the regular meeting of the Fifth District Medical Society, held at Rockingham, N. C., your committee was instructed to draft suitable resolutions expressing the Society's sense of loss of one of its charter and active members; and that copies of these resolutions be spread upon the minutes of the Society, and also sent to the Chairman of the Obituary Committee of the State Medical Society and to the bereaved family.

The tribute paid to Dr. Monroe's memory by a Rotarian friend is expressive of the sentiment of your committee:—"We have lost a loyal and loving member, a servant of humanity, a servant of God. Service above self has brought to his memory a tribute that silver and gold cannot buy, the love of all who knew him."

Therefore, be it resolved:—

That we, the members of the Fifth District Medical Society, do

deeply deplore the death of our esteemed friend and co-worker, Doctor William A. Monroe.

That in the death of this great and good man we have sustained the loss of a steadfast and loyal friend.

That his departure has filled us with a deep sense of personal sorrow.

That to his sorrowing family we extend our sincere sympathy.

Committee

John Franklin Foster, M.D.,
James Shepard Milliken, M.D.,
Alex McNiel Blair, M.D.

WILLIAM A. MONROE, M. D.

Memorial Adopted by the Lee County Medical Society.

Willam Archibald Monroe was born in Moore County, April 18, 1863, and died at Sanford, February 26, 1926. His academic training was taken at the Union Home School, and his medical course at the University of Maryland. After doing some medical work for the State he settled in Waxhaw, where he lived for several years. He then sold out his practice in Waxhaw and after a post-graduate course in Baltimore and New York came to Sanford, May 2, 1894. Here he began a life of service that made him the friend, counselor, and beloved physician of this section of the state. We desire to put on record our appreciation of his sterling character, his accomplishments as a physician, and his service to the community, to the state and to the medical profession. Throughout his nearly forty years of general practice he was to his patients and clientele loyal, faithful, untiring, never counting the cost to himself in comfort or time, but looking only to the welfare of the unfortunate sick under his care and doing all that he might to alleviate their suffering and brighten their dark hours. And in doing this he tied to himself through the years warm, true and faithful friends among his patients and won an enviable reputation as a physician. No wonder when he died there was none too rich and none too poor to do him reverence, and that the attendance upon his funeral was the outpoured expression of the abundant love of a whole people. No memorial we could adopt would do full justice to his life, but no sketch would be at all complete without a statement of his Christian faith, for behind all that he was and all that he did stood the power of a stalwart Christian character.

To the members of his family we extend our sympathy in their deep bereavement, and bid them find consolation in the splendid heritage he has left behind in a life well lived, in duty well done, and in the gratitude of his fellow men.

Be it resolved that a copy of this memorial be spread on the minutes, a copy sent to the family, and a copy to the Obituary Committee of the North Carolina Medical Society.

(Signed) F. L. Knight, M. D., *President,*
Lynn McIver, M. D., *Secretary.*
Lee County Medical Society.

HERBERT PENNELL MOSELEY, M. D.

Dr. H. P. Moseley was born in Lenoir County thirty-six years ago. He attended the University of North Carolina and then studied medicine at the University College of Medicine at Richmond. After finishing a hospital course he located at Farmville, where he practiced his profession for a period of ten years, interrupted only by a period of two years in overseas service. His tragic death occurred August 20, 1925.

From the beginning he was thoroughly interested in and devoted to his profession, giving to it his closest attention and best efforts. He possessed a happy, cheerful, and sympathetic disposition; and was kind, self-sacrificing, and considerate of the wishes, comfort and rights of others. To a marked degree he took these characteristics with him everywhere, especially in the sick room. He was greatly beloved by his friends, patrons and all others. His thorough knowledge of medicine, exceptional training, natural qualifications and early success appeared to mark him as destined to fill a large field of usefulness for many years to come. With the medical profession he was held in high esteem, as a man, as a citizen, as physician. In addition to a large and constantly increasing general practice, he was division surgeon of the Norfolk Southern Railroad, medical referee for a number of insurance companies, and a director of the Bank of Farmville, and he was constantly active and untiring in all those things that looked to the good, the development and the elevation of the community in which he lived.

In the midst of such worthy activities and of a career of so great promise of service to his fellow men, his life was snuffed out by a whiskey-crazed negro whom he had been summoned to attend. As Dr. Moseley approached the door, the negro, sitting in his cabin with a shotgun in hand and being in a semiconscious condition, probably mistook him for an approaching enemy and emptied the contents of the shotgun into his heart. Dr. Moseley fell backward and died instantly. On the next afternoon in the presence of a great company of sorrowing relatives, friends and brethren of the medical profession, his body was laid to rest in the family plot in the cemetery at Kinston, among the scenes of his early life. A noble figure in life, he entered the valley of the shadow of death with no thought of impending danger. He was a man of high ideals, pronounced capabilities, wonderful energy and constant activity, and his labors brought forth much fruit. He lived a life of great usefulness, enjoying the confidence, respect and esteem of all of his friends and associates. His keen sense of fairness and justice to his fellow men made him a favorite with all both within and without the medical profession. In his death his wife lost a most devoted husband, the community in which he lived a most useful worker, the medical profession a most esteemed member, and the State a model citizen.

(Signed) D. S. Morrill, M. D.

WILLIAM WATSON PHARR, M. D.

Dr. William W. Pharr, aged sixty-nine, well-known Charlotte physician, died Saturday morning, July 4, 1925, at his home. He had been in declining health for about three months. Dr. Pharr was born in the

Poplar Tent neighborhood in Cabarrus County, and was the son of Dr. Walter W. Pharr, a prominent Presbyterian minister. He had been practicing medicine in Mecklenburg County since 1881, locating first in Newell. In 1907 he came to Charlotte, where he had been practicing since that time. Dr. Pharr is survivied by his widow, Mrs. Ida R. Pharr, and four sons and one daughter: Rev. Walter W. Pharr, Mount Hope, W. Va.; Query Pharr and Dr. John R. Pharr, of Charlotte; William J. Pharr, of Belmont, and Mrs. Daniel D. Worth, of St. Louis, Mo. Two brothers and two sisters also survive: J. W. Pharr and former Senator H. N. Pharr, Miss Ida Pharr and Mrs. Eva Henderson, of Charlotte.

JOHN BENJAMIN POWERS, SR., M.D.

Dr. J. B. Powers, a well-known physician and business man of Wake Forest, died suddenly of a heart attack at his home on December 31, 1925, having reached the age of seventy-one. He had practiced medicine in Wake Forest for forty-seven years, and had gained the reputation of being a worthy and successful physician and business man. At one time he was professor of bacteriology and pathology in the Wake Forest College School of Medicine. Dr. Powers was born in Pender County and was the son of Dr. J. D. Powers. He married Miss Pattie Brewer of Wake Forest, who, with five children born to them, now survives. The funeral services were held from the Wake Forest Baptist Church.

HICKMAN RAY, M. D.

Dr. Hickman Ray was born in Wake County, September 25, 1889. He was the son of Mr. and Mrs. C. B. Ray, now of Raleigh. He received his education in the Raleigh public schools; Cary high school; Bingham, Asheville; University of North Carolina, and University of Maryland. Following his graduation from the Uiversity of Maryland he became medical adviser to the Atlantic Coast Line Railroad hospital at Rocky Mount, N. C., where he served for some time, later going to Plymouth, N. C., where he engaged in the practice of medicine. While at Plymouth he entered the World War, and was sent to Anniston, Alabama, for duty. He served in France with the United States forces as first Lieutenant, being in charge of a laboratory. After returning to America he spent one year in Goldsboro in public health work, then began practicing medicine in Durham.

On January 26, 1917, he was married to Miss Ethel F. Thompson of Durham. From the union there are two children, Hickman Ray, Jr., aged seven, and Ethel Frances Ray, aged two and a half years.

Dr. Ray passed away October 17, 1925, after an illness of six days.

VIRGIL N. SEAWELL, M. D.

Dr. Virgil N. Seawell died at his home in Faison April 1, 1926, after an illness of only a few hours. He was born in Moore County, July, 1840, and was a man of superior intellect and ability. He graduated at the University of Maryland, receiving therefrom his M.D. degree and was actively engaged in the practice of his profession for sixty years. He served as a soldier in the Civil War. He died at the ripe age of eighty-six years, full of honors.

Dr. R. L. Kerr, Rose Hill:*

I should like to say just a few words in regard to Dr. V. N. Seawell. His home was for a number of years in Moore County, but while still quite a young man he moved to Duplin County and lived there until his death. He practiced at Wallace for many years. Later he practiced at Faison, and held the office of postmaster at Faison for some time. The impression I have of Dr. Seawell is not so much from being associated with him in any practice, but from the fact that I have heard my mother speak of him as her physician, and her physician along in the days when I was a baby, and how patient and skilful he was, and how much care he gave mother and me. I should feel ungrateful if I did not rise to speak a word about him in this memorial service.

Too, in his day, when there was no serum for diphtheria, he was regarded in our community as being very skilful in that particular disease. He was a man of high character, and we believe he has gone to a most blissful reward.

WILLIAM I. SUMNER, M. D.

Dr. William I. Sumner, aged fifty-eight, a prominent physician of Randolph County, died at his residence at Randleman May 6, 1926, following a short period of illness. He was born in Randolph County, the son of J. C. and Agnes Ashworth Sumner; and married Miss Amanda Allred, of Julian, N. C., March 10, 1897. Surviving are his wife and three children: Dr. Emmett Sumner, Dallas, Texas; and Misses Ruby and Jewel Sumner, Randleman. Dr. Sumner was the oldest physician in Randleman and was known and respected throughout the entire county. He was a member of St. Paul's Methodist Episcopal Church, of Randleman, and had been active in religious affairs since early boyhood, having been a steward of his church for many years.

HENRY TULL, M. D.

Dr. Henry Tull was born January 4, 1855, in Lenoir County, and died in Kinston, N. C., May 20, 1926, aged seventy-one years. He was educated at Bingham School, at Harvard Medical School, and the University of Pennsylvania, receiving his medical diploma from the last institution in 1876. He began the practice of medicine in Kinston in April, 1876, and soon acquired a large and lucrative practice, becoming one of the best known men in Kinston. He was a man of many fine qualities and unusual attainments, public-spirited and deeply interested especially in educational matters. He was a friend to the poor and gave much of his service without pay. Kind, affable, and benevolent, he was deeply interested in all measures which concerned the welfare of his community and his people. He was a man of affairs and large business interests, being a large planter and owning extensive areas of land.

Reared and educated in the old school, this aged physician adapted himself readily to the new order, and continued to take interest in the welfare of his people and his profession. Only a few weeks before his death he performed an operation on a charity patient that sorely taxed his nervous strength, and this was the beginning of his final breakdown. His death left a void in his community which will not be easily filled.

*Remarks made during the presentation of the report.

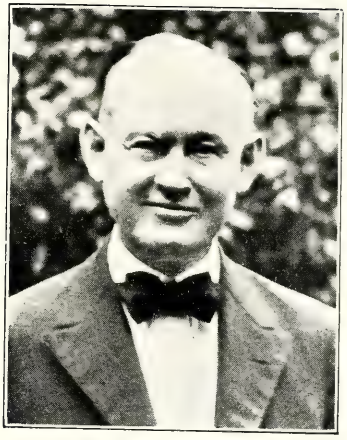
JAMES MONROE TURNER, M. D.

Dr. James Monroe Turner, of North Wilkesboro, died in Long's Sanatorium, Statesville, October 18, 1925, after many years of patient suffering. He was born April 30, 1858, in Iredell County, and was graduated in medicine from the University of Louisville in 1881. Later he took post-graduate work in the University of New York. During several years he served as county physician of Wilkes County; he was also surgeon for the Southern Railway for about twenty-five years. Early in life he joined the Methodist Church, of which he was a consistent member until his death, being a member of the board of stewards at that time. He was a member of the Masonic and other fraternal orders. Dr. Turner was connected with the county and State medical societies. During his long period as general practitioner in Wilkes County, which extended to within two weeks of his death, he endeared himself to numberless people who now mourn him. He preceded his wife to the grave only six weeks.

JOHN WHITEHEAD, M. D.

John Whitehead, A. M., M. D., LL. D., whose life and death we are commemorating, was born in Salisbury, N. C., December 18, 1855, and died at his home in that city April 15, 1926. With the death of Dr. Whitehead the Southland lost one of her most valued citizens, the medical profession a leader, the church a faithful worker, the poor a benefactor. He was a descendent of two of Virginia's most illustrious families, the Colemans and the Whiteheads. His father, Dr. Marcellus Whitehead, was a physician of the highest type and was considered one of the foremost diagnosticians of his day. On his maternal side the Colemans were representatives of Virginia's oldest aristocracy. His brother, Dr. Richard Whitehead, was renowned in the medical profession as a teacher and writer, his book on the anatomy of the brain being used as a textbook in many of the medical schools in the United States.

Dr. Whitehead's early education was not unlike that of other boys, with the exception that even when he was quite young his father spent many hours helping him and teaching him along medical lines. He was graduated from Davidson College at the age of nineteen and then entered the University of Pennsylvania, completing his studies there at the age of twenty-five. He was president of his graduating class, and while attending this school he was awarded a gold medal for a thesis on certain bone conditions. Among the competitors for this medal were classmates who later held most prominent positions in the medical school and were also highly prominent in the profession. He was licensed by the State Board at Wilmington in May of the same year he graduated, 1880, and began the practice of his profession in Salisbury, in which place he continued to practice for forty-six years. Three years after receiving his medical degree he was made one of the vice-presidents of the State Medical Society, and later was a member of the State Board of Health. His alma mater, recognizing his ability and leadership, conferred upon him the degree of doctor of laws. He married Miss Rose Irving Morris of Virginia, and from this union three children were born: Richard,



John Whitehead, M.D.

Susie, and Edward. He is survived by his wife and two children, Mrs. John Osborn and Dr. Edward Whitehead, Richard having died during infancy. Edward is a recent graduate from the medical department of the University of Pennsylvania.

As a husband and father Dr. Whitehead was faithful, loyal, congenial, thoughtful, provident. He was lenient and reasonable in his demands, yet firm. He was one who ordered his house well. As a friend he was one of those great souls that bless you by coming in contact with you. He was true, loyal, faithful, constant; to know him was to love him. Seldom in his life did he show agitation by anger or temper while dealing with his medical brethren or others. He was of a retiring nature but was always ready and anxious to give his help and advice for the good of his community and state. He had no ambition to hold office in the medical societies of which he was a member, neither did he seek to affiliate or connect himself with fraternal societies, although he was a member of the Knights of Pythias. As a writer, although he never wrote any medical books, he did write many articles on medical subjects, all of which showed his exceptional learning in that field. He belonged to that class of practitioners who devote their lives to the relief of others by materially assisting in the nursing as well as directing the treatment. He probably never refused to make a call or attend a patient, even though he knew that he would get no financial remuneration. He would frequently, while attending a patient, sit up all night and do the duties that a nurse should have done. For forty-six years his patients came first in his thoughts regardless of pecuniary remuneration.

Dr. Whitehead was a cheerful giver to charity, and he was not only one of the most active members of the First Baptist Church but also was one of the most liberal donators to this church; in fact, as a churchman and Christian he had no superior and few equals. Christianity was the first and most important thing in his life. He was never too busy to talk about his Christ and his church. As long as he had the strength to do so he was always in his place at every service. He used the Golden Rule as a guide and was always ready and willing to witness for Christ. His daily life was patterned after that of the Master. He will be missed so much, oh, so much, but "he being dead, yet speaketh", for "the righteous shall be had in everlasting remembrance".

C. M. Van Poole, M. D.

JOHN WHITEHEAD, DOCTOR OF MEDICINE*

"Know ye not that there is a prince and a great man fallen this day in Israel?"

Ever since this noble tribute was paid by King David to his faithful and valiant warrior, Abner, these words recur when a truly forward man ceases from his labors and joins the innumerable caravan whose ranks are ever swelling in that land watered by the River of Life. Such was the man who finished his career of great usefulness in his chosen field of labor in the town of his birth, April 16, 1926. John Whitehead, whose life I essay to portray with faltering pen, was born in Salisbury in the

*Filed after the annual meeting, for publication in the Transactions.

year 1855, and hence was permitted by a gracious Providence to round out the years accorded by the Psalmist. To what purpose those years were devoted and what harvest attained, let the grateful and almost worshipful citizens of that town attest without dissenting voice.

Dr. John Whitehead was reared under the careful tutelage of his distinguished father, Dr. Marcellus Whitehead, whose endowments and graces not only captivated all in his day and time but transmitted to his son a benediction and latent forces which, richly embellished by application and study, raised him to high and rare distinction in medicine. After finishing his course at Davidson College and being awarded its degree of master of arts, John Whitehead entered the University of Pennsylvania and took his degree in medicine in that then, and now, college of highest rank in our country. Returning to his native town, he at once ardently took up the active work of an all-round doctor, being associated with his father. Perhaps it may, for some, mar these words to say that at that time the field of medicine included and assumed the care of the whole body. There were no specialists at that time, the body being not divided, like all Gaul, into three parts or any multiple of three parts. The doctor then was monarch of the entire machine. "Not only my feet, but my hands and my head also" after the manner of the apostle, were turned over to and preëmpted by the old-time family doctor; and many more perhaps went down to their houses justified and bearing fewer marks of the slings and arrows of outrageous fortune than is now the case.

John Whitehead was preëminently the master of the whole craft. Combined with a rare skill in diagnosis and a profound knowledge of the action of drugs, he possessed high ability as a surgeon and did many difficult operations on the human body. His resources in the wide field of materia medica and therapeutics approached almost the marvelous. His dependence first was on the great field of remedial agents which a great and beneficent Father so mercifully has provided for the ills of the body; he believed fully in exhausting this field ere calling the knife into requisition. Let no one for a moment harbor the thought that I am belittling surgery. Its claims are monumental and its devices entitled to the highest credit, but John Whitehead believed that the flora of this earth held some of those potentialities, seen by the seer, "whose leaves shall be for the healing of the nations." For nearly fifty years John Whitehead went in and out of the homes of his community, and many more remote, always bearing himself as a prince and true physician, and carried with him the invocations of love and gratitude from every heart which felt his benign administrations. To say that he was among his medical brethren "facile princeps" is only a trite expression, admitted by all. Dickens has been said to be "a Shakespeare working in the terra-cotta". This earth and earth's sufferers and toilers claimed the mind and heart of him whom I am commemorating. His presence in the sick room was a golden ray of sunshine and cheer.

While my heart is, I admit, guiding and inspiring my pen, yet I have not in this sketch allowed the element of hyperbole to exert an influence. We were in Philadelphia at the same time, he at Pennsylvania and I at Jefferson. He honored me ever with his warm friendship here, and I look forward to a renewal of that friendship in the land which needs no light of the sun. THOS. E. ANDERSON, M. D., Statesville.

JOHN R. WOLTZ, M. D.

Dr. Woltz was a Civil War veteran and a prominent citizen of Surry County. He had rounded out eighty-five years and his death was the result of the infirmities of old age. He was a member of the Methodist Church and a Christian character of the highest type, a polished gentleman and a splendid physician.

MARSHALL HALL FLETCHER, M.D., F.A.C.S.*
AN APPRECIATION

BY

J. Howell Way, M.D., Waynesville

Descended from a sturdy, virile stock which has for some centuries furnished the British Isles with numerous citizens of rank and character and a people which, transplanted to American soil more than two hundred years since, has given an equally good account of itself in contributing useful men and women to the state and nation, the subject of this sketch was born December 20, 1858, at the old Fletcher homestead, a few miles south of Asheville, N. C., on the Hendersonville road. His father, himself a highly respected and honored member of the medical profession, the late Dr. George W. Fletcher, was born at the same place and resided there following his marriage to Miss Elizabeth Ann Clayton. Before his father, his grandfather, John Fletcher, who was wedded to Miss Martha MacBrayer, had resided there on property originally settled on by the great-grandfather, William Fletcher, shortly after his discharge from the Continental Army at the close of the Revolution. Five Fletcher brothers fought on the American side in this conflict, and history records the death of two of them at the battle of King's Mountain.

The son of an educated and successful physician, and bearing the name of the distinguished English physician and writer, Dr. Marshall Hall, apparently young Fletcher easily and naturally enough selected medicine as a profession, and after receiving such preliminary education as the local schools afforded he was sent to Weaver College. He then spent two years in study in Bellevue Hospital Medical College in New York City, was graduated with the degree of doctor of medicine, and served two years as resident physician in the Jersey City Hospital, N. J. Returning to his home state, he successfully passed the North Carolina State Board of Medical Examiners at its initial meeting with the Medical Society of the State of North Carolina, held at Asheville in 1881, less than a year after the completion of the W. N. C. Railway to Swannanoa Junction, as Biltmore was then known. At this session of the State Medical Society, in company with his father, Dr. George W. Fletcher, he joined the society, along with Drs. W. L. and W. D. Hilliard, D. J. Cain, Percy T. Norcop, W. C. Brownson, James G. Hardy, M. F. Broyles, and John Hey Williams, composing the Asheville members of the profession, and Drs. J. A. Reagan and R. J. Wilson of Swannanoa and H. B. Weaver of Weaverville—all Buncombe County physicians. In addition

*This should have appeared in the 1925 Transactions, but was received too late for publication therein.

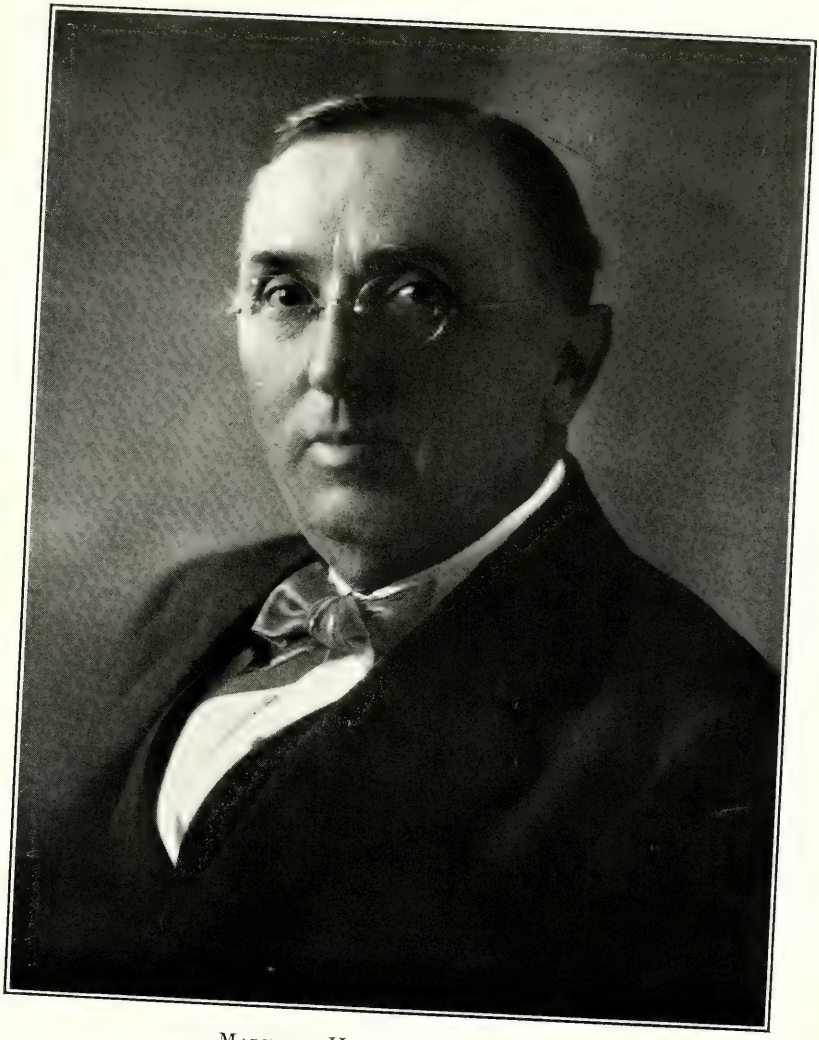
to the Buncombe County physicians joining the State Medical Society at this first session held in the mountain district, there were also admitted to membership Drs. J. M. and Samuel Harley Lyle of Franklin, Macon County, and Drs. W. Latta Reagan and James G. Craigmiles of Madison County, both lately removed from Buncombe. These were the first physicians west of Morganton to unite with the State Medical Society.

Following a short period in practice with his father at Shufordville, as Fletcher post office was known then, Dr. M. H. Fletcher in the winter of 1884-5 removed to Asheville, where he immediately became a potential factor in professional affairs. Along with the Buncombe County doctors mentioned above and with Dr. James A. Burroughs (who had preceded him a year or two in locating in Asheville), he assisted in the organization of the Buncombe County Medical Society, of which he was a most consistent and helpful member to the day of his death. Of his affiliations with the county and state societies, it may be truly said that neither ever had a more loyal member or one who more earnestly strived to serve their best interests in every possible way. His zeal in their affairs was unflagging, and whether as a member in the ranks or in official position, Dr. Fletcher could always be counted as a physician who with wise and discriminating judgment loyally promoted whatever he believed to be the best for the development of medical organization. At the same time, those of us knowing him intimately well recall that he always took careful note of the relation of the profession's affairs to and effect upon the public at large.

His was a broad and wholesome mentality capable of seeing the many sides of things affecting humanity and with rugged honesty of purpose standing loyally for the right in all things. His medical society activities included membership and regular attendance on the sessions of both the State Medical Society and the American Medical Association. In the State Society he from the first manifested a deep interest and besides regular attendance took a very active part, functioning in discussions and serving on important committees, including the "Re-organization Committee" of 1902-3 which gave us our present State Medical Society constitution and by-laws, with membership in county societies as the fundamental unit of all professional association organization.

The choicest honors all came to him unsought. In turn he was first vice-president in 1901, member of the North Carolina State Board of Medical Examiners from 1902 to 1908, and president in 1915-16. He was also a member of the American College of Surgeons and deeply interested in its uplifting influence upon the practice of surgery in America.

In aiding the ladies of the Asheville Flower Mission in promoting the organization and development of the first permanent local hospital to be established between Charlotte, N. C., and Knoxville, Tenn., Dr. Fletcher undoubtedly performed a service to his profession and to the people of this section, the influence of which is difficult to properly estimate in its far-reaching and helpful power for good. When he came to Asheville its medical profession, then as now, ranked as containing an average high grade type of trained medical man. At that date (1884) more than one-fourth of the profession had enjoyed the benefits of post-graduate study for prolonged periods in European centers. Becoming chief of the staff



Marshall Hall Fletcher, M.D.

at the Mission Hospital in the period of its infancy, when the equipment was extremely limited, the service indifferent, and the possible rewards only alluring from the viewpoint of a duty performed, he resolutely set himself to the task of creating a really helpful thing where only a necessity had previously existed. How well he, with the constant and untiring efforts of the noble women of the Flower Mission, built on the original pitiful foundation, time and resulting progress attest. He was a master builder under whose inspiring touch the old semi-dilapidated eight-room Hawley home evolved into the present-day handsomely appointed, well equipped Mission Hospital, admitted by all to be one of the most successful of the quasi-public hospitals in the state. His growing hospital work and the grave responsibility of being through these long years the chief of service removed Dr. Fletcher from the honorable rank of being one of the community's most valuable and respected general practitioners of medicine and wise family consultants, and made him one of the best all-around general surgeons of North Carolina. The institution was ever his constant pride and regarded by himself as his life's greatest accomplishment.

With the passing of time and the broadening of his knowledge and his vision there inevitably came the appreciation of the greater possibilities in hospital development and accomplishment than even he and his devoted loyal co-workers had been able to attain, and his president's address before the Medical Society of North Carolina, delivered at the annual session in Durham, April, 1916, may well be accepted as Hall Fletcher's ripened knowledge and matured wisdom on the subject of hospitals. He made the subject of that address, generally accepted as one of the most masterful presidential addresses in the history of the North Carolina State Medical Society, a strong and powerfully convincing plea for community or county hospitals. As he then truly said, such a hospital "must be supported in large measure by county taxation; must have a well equipped laboratory for its own use, as well as to make laboratory tests and examinations for all the doctors in the county". Again, he said, "As much as we deplore it, it is a fact that the family physician is disappearing from the community and the so-called 'grouping of physicians' taking his place, this group centering around an individual or a private hospital. I think there would be far less danger of commercializing our profession by having the grouping take place around the 'community hospital,' where every doctor who has developed special skill along special lines, loves certain kinds of work better than he does a dollar, and who does certain kinds of work better than anybody else in his community, should be given an opportunity to further develop his skill." When, as will inevitably happen in the very near future, the issue of the public's assuming through all of its taxpayers the responsibility of housing and caring for the sick in the community or in the county, as a public duty, is seriously impressed upon the public conscience, this masterful address of Dr. Fletcher's will be quoted as coming from one whose matured experience entitled him to "speak as one having authority".

Of the medical men of Asheville, whose thoughtful planning and earnest labors have given that fair city a health department nationally famed, none from the earlier days of the growth of health service were more

zealous or gave more freely of time and talents than Dr. Fletcher, he being one of the founders of the health movement and serving for several years as a member of the local health board. At one time he accepted the challenge of a political friend and ran for a place on the board of aldermen of his city, for the purpose of better serving the health interests of his community. In politics he was a Democrat who believed in party organization and party government, yet he was resolutely mindful of the advisability always of securing honest and worthy officials for political preferment. He was a Christian gentleman of the highest ideals, a consistent member of Trinity Episcopal Church at Asheville, and served for a number of years as vestryman.

Among the numerous civic activities for which he found time, despite the always insistent demands of a large practice, was the good-roads movement. Developing, as this did, earlier in Buncombe County than in most sections of the state or nation, this effort for better transportation facilities found in him an early and a persistent advocate, and he served for some time as an official of the Buncombe County Good Roads Society.

While never able (and I seriously doubt if he ever was really willing to try) to entirely divorce himself from the many humanitarian demands accruing from his long years of work as a general practitioner of medicine in town and county, during the latter half of his professional career he devoted himself chiefly to surgical work, attaining a high degree of success. He carried to his end the confidence of both profession and laity; confidence in the belief that his every surgical advice was prompted alone by a desire to afford the greatest possible benefit to his patient. Conscientious in his mental concepts, he carried this quality into every phase of his life work.

When the United States declared war against Germany, Dr. Fletcher was beyond the age of usual military service, but he was among the first of the more than twenty splendid members of the Buncombe County profession who patriotically volunteered. He was tendered and accepted a commission as Major in the Medical Reserve Corps in the United States Army. Later in the year 1917 he was sent for training to Fort Oglethorpe, Georgia, and during the following winter with Base Hospital Unit No. 65, Major John W. Long, C. O., was sent to Brest, France, where he functioned as an active member of the surgical service until the close of the war.

Dr. Fletcher returned home in 1919 and attempted to resume the duties of his former active practice, but it was soon evident to his many friends, as well as to himself, that his work was well nigh done. The severe and unusual duties devolving upon an efficient medical officer in time of war had in all probability at least hastened if not incited the subtle processes of physiological decline. It was in vain he sought relief at the hands of some of America's most celebrated men of our profession; the relentless forces of nature hurried him on; and on Friday, January 30, 1925, in his home at Asheville, this good man passed to his final reward, mourned by his devoted wife and daughter and a vast number of

friends and former patients, as well as an appreciative community, who recognized him as one of the city's foremost citizens and greatest physicians.

Dr. Fletcher was married September 23, 1926 to Miss Jessie Winne Rosencrans, Albany, N. Y., who survives him. Of this union four children were born, three of whom preceded their father. One daughter survives, Lillian, the wife of Mr. Wm. M. Smathers, one of Asheville's widely known merchants.

While Dr. Fletcher was admittedly recognized by the members of the local profession as dean of the medical faculty, and was cheerfully accorded that preference, it is in no sense a detraction from the distinctions and the honors justly bestowed upon our deceased brother and friend to say that he achieved his great success in life through his personal honesty, his boundless integrity, and his earnest sincerity of purpose at all times and in all things, plus the exercise of a degree of energy put forth by few men. He was preëminently a fearless, honest, upright man, clothed with the fear of God and imbued with kindly respect for his fellow men; a good citizen, a capable physician and a competent surgeon. He never knew effort too great for the accomplishment of the things he regarded as his duties, and, inevitably, success, preferment and honor, due such a man, came to him.

Peace to his memory! Inspiration in the study of his life work!

ALBERT C. FOX, M. D.

Died April 7, 1925.

Note: Through a printer's error, this name appears in the 1925 Transactions as "Cox."

REPORT OF COMMITTEE ON CO-OPERATION WITH A COMMITTEE FROM THE STATE BOARD OF MEDICAL EXAMINERS AS TO A WHOLE-TIME SECRETARY OF THE BOARD OF EXAMINERS

The following report was presented by Dr. J. Howell Way, Chairman, and was accepted.

Your committee to coöperate with a committee from the State Board of Medical Examiners, as to a whole-time secretary of the State Board of Medical Examiners, report that while members of the State Board of Medical Examiners are elected by this society, and while we regard this as fitting and right and cherish it as a mark of the continuing confidence of our lawmakers in the State Medical Society, we recognize that, once elected, the members of the Board of Medical Examiners become and assume the functions of state officials, vested and charged with the right to select their own officers. Hence your committee would view any action on our part in the matter of the officers of the State Board of Medical Examiners as wholly superfluous and inadvisable under the existing North Carolina statutes creating the State Board of Medical Examiners.

(Signed) J. Howell Way,
H. A. Royster,
A. A. Kent.
Committee.

REPORT OF COMMITTEE TO CONSIDER THE FEASIBILITY OF SECURING A WHOLE-TIME SECRETARY OF THE STATE MEDICAL SOCIETY

The following report was read by Dr. J. Howell Way, Chairman, and was accepted.

Your committee appointed to consider the feasibility of securing a whole-time secretary for the Society advise that in view of the fact that an examination of the work of the secretary-treasurer's office evinces a steady and regular advancement in membership, and in view of the further fact that the society appears to be functioning well under the present system, there exists no real necessity for making such a change, and we advise against the suggestion at this time.

(Signed) J. Howell Way,
A. A. Kent,
H. A. Royster,
Committee.

RESOLUTION OF THANKS

The following resolution was proposed by Dr. J. Howell Way:

Mr. President, I desire on behalf of my colleagues and friends (which includes everybody in the society and their wives and children who came with them) that this body express its sincere appreciation and heartfelt thanks to the members of the profession in Wilmington, and particularly to the ladies of Wilmington for their courteous care of and attention to the ladies who accompanied us and the pleasures they have given those ladies during our stay, as well as their many and various courtesies to us during our stay here.

On motion of Dr. L. B. McBrayer, the resolution was adopted.

ON OPPOSING AND EXPOSING QUACKS

The Chair recognized Dr. J. M. Northington, Charlotte, who made the following statement:

I have a matter to bring before you which I think will be of interest to the profession. It is following out the idea that I adopted when taking over *Southern Medicine and Surgery,* which is that every obstruction shall be placed in the way of irregular practitioners that it is possible for us to put there.

On June tenth I saw in the Charlotte *Observer* a photograph of "Dr." Julie L. Stevenson and this advertisement:

"North Carolina's healthtorium, of which Dr. Stevenson is the founder, is the realization of a 20-year ambition. It is a place for people with tired nerves or bodies who are seeking rest and rejuvenation, according to Dr. Stevenson. Here the patient may get back to natural foods, sunshine, outdoor living and right thinking, the psychologist says."

I sent over the name of Dr. J. P. Kennedy, Secretary of the Mecklenburg County Medical Society, this cablegram, to which the following reply was received:

Charlotte, N. C., June 10, 1926.

Chief Surgeon
American Hospital,
Paris, France.

Lady styled Doctor Julie L. Stevenson here says she is your sister. Please affirm or contradict.

J. P. Kennedy, Secretary,
Mecklenburg County Medical Society.

J. P. Kennedy,
Mecklenburg County Medical Society,
Charlotte, N. C.

No such person known here.

Doctor Gros,
American Hospital, Paris,
3 28 P Jun 11.

That evidence was submitted to the Charlotte *Observer,* which did not see fit to publish it but on the following Sunday published this statement:

"God was kind to man," says Arthur Brisbane, "when He gave to the world this radiant woman."

The following interchange of telegrams with Mr. Brisbane took place:

Charlotte, N. C., June 13, 1926

Arthur Brisbane,
New York American,
New York City.

Story local newspaper quotes you "God was kind to man when He gave the world this radiant woman", Dr. Julie LaSalle Stevenson. Please wire confirmation or denial.

Southern Medicine and Surgery.
New York, N. Y., June 14, 1926.

Southern Medicine and Surgery,
Charlotte, N. C.

So far as I know never heard of lady mentioned your wire. Did not write statement attributed to me.

A. Brisbane.

Gentlemen, it seems to me the medical profession has followed Gandhi's idea of nonresistance to the point that it is making itself a laughingstock, and what is more important to the medical profession, to the point that the press pays less attention to us as a body than it does to the barbers or paperhangers or any other body of men of like numbers. I bring this evidence before this body in the hope that some action will be taken. I am assured by the Charlotte *News* that if any action is taken by us, the *News* will be very glad to publish it.

On motion of Dr. J. M. Templeton, seconded by Dr. O. C. Daniel, the matter was referred to a committee, with power to act. The President appointed Drs. John Q. Myers, J. P. Munroe, and A. M. Whisnant as the committee to act with Dr. Northington on the matter.

REPORT OF THE HOUSE OF DELEGATES

The Secretary of the Society reported the action of the House of Delegates in the election of officers and committees. Upon motion duly seconded, the report was accepted.

INSTALLATION OF PRESIDENT

Dr. MacNider, President:

It is now my great pleasure to do a kindly thing to a kindly gentleman, as my last act of service as president of this Society. We have come to the point where we install our new president, Dr. John Q. Myers, of Charlotte. I shall ask Dr. Way and Dr. Laughinghouse to escort Dr. Myers to the chair. (The committee named having escorted the president-elect to the front) Dr. Myers, I hope sincerely that you will have as happy a year as I have had.

Dr. John Quincy Myers, President:

Mr. Chairman, and gentlemen of the Medical Society of the State of North Carolina: I feel that I would be a moral coward if I did not admit that I am proud of this position that you have tendered to me this evening. Little did I think sixteen years ago, when I had the privilege and pleasure of acting as vice-president of this Society and assisting in presiding over the meetings in this room, that I should one day be escorted up here as president. Neither am I unmindful of the responsibilities of this position, for I feel them keenly, and I hope that you will help me to meet them. I am grateful for the other honors which have been given me, having served as a member of the Board of Medical Examiners for six years, and having represented you at meetings of the American Medical Association, and in many other ways. You have been good to me. I want to ask the Great Physician and Master to help me, and, with your coöperation and advice, I shall do all I can during the coming year to advance the interests of our Society and our profession.

RESOLUTION OF THANKS TO THE RETIRING PRESIDENT

Dr. J. Howell Way, Waynesville:

I have been a member of the Medical Society of the State of North Carolina for thirty-nine years, during which time I have attended all of its sessions except those of the years 1889, 1892, and 1897. I deem membership in it an honor and a privilege, and I belong to no other human society that I appreciate so much as I do membership in this body. It is a great body because it is made up of great constituent parts. I have just been thinking of the fact that we cover and include in its membership all types and grades and classes of Carolina's medical men. Our retiring president is a great scientist; such a man that, a few months ago

when I spent the day in the University of Michigan Medical School, where I was the guest of an official of the medical department, who exhibited a real interest in showing me what they were doing, one of the first questions he asked me was about Dr. William deB. MacNider. They knew him; knew of the work he is doing, just as men who are doing scientific medicine and who are engaged in research all over the world know MacNider. He retires, and in his stead sits a fine and fitting representative, not of the research worker, but of the helpful, wholesome, practical clinician in medicine. It is a great society, gentlemen.

So much for that. Mr. President, I desire that the thanks of this society be and are hereby extended to Dr. William deB. MacNider for a most complete and satisfying year's administration as president; and that we assure him that, while we respected and honored him when we elected him, after his year's work through the county societies and in the district societies, culminating in his presiding over the annual session of the State Society, we not only continue in our respect for him, but we love him and we cherish him as one of the greatest North Carolina teachers and doctors who ever presided over the destinies of the State Medical Society. I move, sir, the adoption of this as a fitting minute to go in the records of the Society.

This motion was seconded, and carried by a rising vote.

DR. MACNIDER:

Mr. President, things like this come to me so unusually that I do not know what to do. I know how I feel, but I do not know how to act. So I asked Dr. Hunnicutt—I don't know why I turned to Dr. Hunnicutt, except somehow he reminds me more of Dr. John Whitehead than any man I have known in a long, long while; and Dr. Hunnicutt says that I ought to make some reply to this gracious statement of Dr. Way's. But one can not reply to a thing like that; one can only accept it with sincere appreciation and thankfulness; and this is what I do.

The Society then adjourned *sine die*.

CONJOINT SESSION

OF THE

MEDICAL SOCIETY

OF THE

STATE OF NORTH CAROLINA

AND THE

NORTH CAROLINA STATE BOARD OF HEALTH

WEDNESDAY, JUNE 16, 1926.

The Conjoint Session of the Medical Society of the State of North Carolina and the North Carolina State Board of Health met at twelve twenty P. M., in the convention room of the Oceanic Hotel, Wrightsville Beach, with Dr. J. Howell Way, Waynesville, President of the State Board of Health, presiding.

ANNUAL REPORT OF THE SECRETARY OF THE NORTH CAROLINA STATE BOARD OF HEALTH

G. M. Cooper, M.D., Acting Secretary, Raleigh.

Mr. President and Members of the Conjoint Session of the Medical Society of the State of North Carolina and the North Carolina State Board of Health:

It becomes my responsibility to submit for your consideration the annual report covering the activities of the North Carolina State Board of Health for the past year. In this instance the report actually covers a period of nearly fourteen months, since the last report was made in April, 1925, by the retiring secretary. In many respects the past year has been the most critical in the history of the board. There are several reasons for such a statement. The State Board of Health was organized in 1877, or a little more than forty-nine years ago. The whole State Medical Society constituted the board membership at first, by legislative act. The appropriation annually was placed at $100 per year, and Dr. Thomas Fanning Wood, of Wilmington, was elected as secretary. Dr. Wood concentrated his efforts and rendered the state outstanding service from that time until his death on August 22, 1892, therefore serving the board with distinction as its first secretary for a period of approximately fifteen years. Within two weeks after the death of Dr. Wood, Dr. Richard H. Lewis, of Raleigh, was elected secretary to succeed Dr. Wood, the annual appropriation at that time having reached the sum of $2,000. The official record of Dr. Lewis is an open book for the following seventeen years, lacking only about two months. Following the act of the legislature in 1909 providing for a whole-time secretary, Dr. Lewis' resignation became effective July 1. In the meantime the board offered the secretary's place to Dr. J. Howell Way, who declined it.

Following Dr. Way's declination the board immediately elected Dr. W. S. Rankin, at that time a member of the medical faculty of Wake Forest College, who accepted the place and assumed the duties July 1, 1909. Dr. Rankin served for a period of sixteen years, lacking one month, or until May 31, 1925. Therefore it will be seen that for a continuous period of forty-eight years the board was not without an official head except for the two weeks following the death of Dr. Wood, when Dr. Lewis assumed the duties of the office. At a special meeting of the board in the executive office in Raleigh, May 30, 1925, I was designated as Acting State Health Officer for an indefinite length of time, or, as specified by the board at the time, I was commissioned to act until a permanent successor to Dr. Rankin was elected. It will therefore be readily understood that the period in that respect has been a critical one, as it has been the first time since its organization that the board has not had an executive officer with determined status and full authority to outline plans and policies. This means that the period has been a very hard one, especially in view of the fact that the activities of the board have expanded until every section of the state is concerned. The organization is a large one, and even a smaller organization would find it hard to function without a dominant head with driving power and absolute authority to carry through the definite and agreed policies of the board. Another reason which has tended to make the period an exceedingly hard one is the fact that the legislature of 1925 enacted drastic and far-reaching laws revolutionizing completely the fiscal policy of North Carolina. Since July 1 of last year it has been an entirely different world in which State officialdom has been moving. In this connection I wish to state publicly that the Acting Secretary and the State Board of Health have been and are now in full accord with the policies of Governor McLean and his administration. The enactment of the Budget Law and its administration, while serving to make for a great deal of additional work in transferring from one system to another, has been one of the wisest steps ever taken in the fiscal policy of North Carolina. It is now saving the tax payers money and it will continue to do so in ever increasing volume so long as the existing policies are as closely followed and honestly executed as at present.

Notwithstanding the numerous difficulties in the way and the fact that it has been to a great extent a period of uncertainty, the affairs of the board have moved with a minimum of friction and a maximum of efficiency. This fact has been due in large part to the ability and loyalty of a majority of the staff and employees of the State Board of Health. Without a close adherence to the spirit of duty and loyalty on the part of these people it would have been impossible for the work of the board to have efficiently functioned during this period.

There have been some consolidations in which economies have been effected and in which efficiency has been promoted, but there has been no drastic change in the working methods or the policies during the year.

Specifically speaking, it may be mentioned that the State Laboratory of Hygiene has functioned with its usual precision, has enlarged its activities and extended its usefulness in a most satisfactory manner. The Department of Sanitary Engineering has been able to extend the adop-

tion of the standard milk ordinance, promoting a safer milk supply, to a number of additional cities and towns, and the regulation of water supplies and sewage disposal has been carried on and expanded with gratifying results. The Department of County Health Work has been concentrated and is at present most efficiently functioning. The State subsidy has been extended until at present thirty-four counties are participating in the coöperative plan of work with contracts signed with three additional ones, effective July 1, 1926, being the largest number in the history of the state, and there are at present more efficient health officers heading these county departments than ever before. Nearly one-half the population of North Carolina are living in counties embraced in this coöperative plan. The work of the Department of Maternity and Infancy has expanded and enlarged until at present seventeen counties are carrying on this conjoint program, aided by the State and Federal Governments, under the provisions of the Sheppard-Towner Law. Some of this work is proving to be exceedingly satisfactory, and all of it is effecting a definite lowering in the mortality rate of children under two years of age. During the past year, in response to the vast industrial development and expansion of water power developments from one end of the state to the other, the board has put into effect what is hoped to be an efficient method of mosquito control with resulting protection against the spread of malaria resulting from these projects. The work for schoolchildren has continued in about the same proportion as heretofore except that there was a reduction in the number of clinics held during the past year, but an increase in the number of inspections made and therefore an increase in the educational distribution of the work. From the standpoint of health education it need not be mentioned, because it has been apparent to every reader of newspapers that more of the information to the public in methods of disease prevention has been carried by the daily newspapers of the state than ever before in our history. From an epidemiological standpoint deaths from diphtheria were fewer the past year than for several years, but the rate is still distressingly high and is a matter for major consideration by every city and county health officer in the state and by every practicing physician, as well as the State Board of Health itself. The deaths from diarrhea and enteritis in children under two years of age dropped two and one-half points in 1925. This speaks well for the future, but our rate in that particular is still far above what it should be. Although the state maintained its position of having the highest birth rate in the Union, as for the past several years, the death rate for 1925 was only 11.5 per 1,000, which is a most favorable comparison with other states in the registration area. Incidentally it may be remarked that the death rate from typhoid reached the record low point of 9.6 per 100,000.

During the year we have been most fortunate in securing the location at Edenton of the International Health Board's field station for the study of the control of tidewater malaria. This is work of the greatest importance, and is financed entirely by the International Health Board.

We have recently instituted a system of weekly reports to county and city health officers giving promptly the location of reports of contagious disease. This should be of great help in effecting really scientific control of communicable disease.

In conclusion I wish to take this means of officially declaring that the resignation from the service of Dr. Rankin, effective at the beginning of the period under discussion, more than a year ago, was a serious loss to the state health service. Under Dr. Rankin's official stewardship the span of life in North Carolina was greatly increased, but the chief loss to the State Board of Health was the moral loss. Dr. Rankin's name had come to be a trade-mark for the board, the loss of which is a very material one.

On motion of Dr. K. P. B. Bonner, Morehead City, the report was adopted.

The Conjoint Session then adjourned *sine die*.

EXECUTIVE STAFF OF THE STATE BOARD OF HEALTH

G. M. Cooper, M. D., Acting Secretary.
H. A. Taylor, M. D., Director Bureau of Maternity and Infancy.
C. N. Sisk, M. D., Director Bureau of County Health Work.
C. A. Shore, M. D., Director State Laboratory of Hygiene.
H. E. Miller, C. E., Chief of Bureau of Engineering and Inspection.
F. M. Register, M. D., Deputy State Registrar of Vital Statistics.
M. L. Townsend, M. D., Director Bureau of Health Education.

MINUTES OF THE HOUSE OF DELEGATES

MONDAY, JUNE 14, 1926

The House of Delegates met in the convention room of the Oceanic Hotel at eighty-thirty P.M., and was called to order by the president, Dr. William deB. MacNider.

The roll was called by the secretary, Dr. L. B. McBrayer, and the following delegates were present:

County	*Delegate*
Alamance-Caswell	C. W. McPherson
Anson	
Ashe	
Avery	
Beaufort	Louis H. Swindell
Bertie	L. B. Evans
Bladen	D. H. Bridger
Brunswick	
Buncombe	C. V. Reynolds, W. J. Hunnicutt, M. A. Griffin, M. S. Broun
Burke	
Cabarrus	W. H. Wadsworth
Caldwell	A. A. Kent
Carteret	Ben F. Royal
Catawba	W. P. Speas
Chatham	R. W. Palmer
Cherokee	
Chowan-Perquimans	
Cleveland	E. A. Houser
Columbus	
Craven	
Cumberland	R. L. Pittman
Currituck	
Davidson	
Davie	
Duplin	R. L. Kerr
Durham-Orange	Foy Roberson, R. L. Felts
Edgecombe	J. M. Baker
Forsyth	C. S. Lawrence, E. A. Lockett
Franklin	H. H. Johnson
Gaston	J. L. Blair
Gates	
Granville	N. C. Daniel
Greene	
Guilford	J. W. Tankersley, C. D. Thompson, F. R. Taylor, J. W. Long
Halifax	T. W. M. Long
Harnett	J. F. McKay
Haywood	F. M. Davis

Henderson ..... Guy E. Dixon
Hertford .....
Hoke ..... L. B. McBrayer
Hyde .....
Iredell-Alexander ..... T. E. Anderson
Jackson .....
Johnston ..... B. A. Hocutt
Jones .....
Lee .....
Lenoir ..... R. S. McGeachy
Lincoln .....
McDowell ..... J. F. Jonas
Macon-Clay .....
Madison ..... Eva M. Locke
Martin ..... Wm. E. Warren
Mecklenburg, R. T. Ferguson, H. L. Sloan, J. W. MacConnell, Parks M. King, W. W. Craven
Mitchell-Watagua .....
Montgomery .....
Moore ..... J. W. Dickie
Nash ..... E. B. Quillen
New Hanover ..... J. G. Murphy, W. H. Moore
Northampton ..... C. P. Parker
Onslow ..... Cyrus Thompson
Pamlico ..... O. C. Daniels
Pasquotank-Camden-Dare ..... H. D. Walker
Pender .....
Person .....
Pitt ..... G. G. Dixon
Polk .....
Randolph ..... C. A. Hayworth
Richmond ..... A. C. Everett
Robeson ..... J. Fred Nash
Rockingham .....
Rowan ..... C. M. Van Poole, C. W. Armstrong
Rutherford ..... Douglas P. Murphy
Sampson ..... G. L. Sikes
Scotland .....
Stanly ..... J. Clegg Hall
Stokes .....
Surry .....
Swain .....
Transylvania .....
Union .....
Vance ..... H. A. Newell
Wake ..... J. B. Wright, Hubert A. Royster, B. J. Lawrence
Warren ..... G. H. Macon
Washington-Tyrrell .....
Wayne ..... W. H. Cobb
Wilkes .....

Wilson ..... Ben H. Hackney
Yadkin .....
Yancey .....

On motion of Dr. J. S. Murphy, Wilmington, members of the Society present from counties for which no delegates were present were seated as delegates.

PRESIDENT'S MESSAGE

William deB. MacNider, M. D., F. A. C. P., Chapel Hill

During the past year I certainly have had a great many privileges extended to me by the medical men over the state. I have been to all ten district societies at their regular meetings, and two of the districts I visited on more than one occasion. The county men have been kind enough to me to ask me to be with them, and I have been to twenty-eight society meetings and other meetings since last June. It gives me a kind of spiritual uplift (I think that is the best name by which I can call it) to go all over the state and meet my medical brothers and know at first hand the stuff of which they are made. It has given me, as I say, a kind of exultation for the profession as a whole, and I do wish that more than one person a year could have this opportunity to get on the inside of any smallness a member may have, and find out the great quantity of fineness and goodness that is in him.

My little talk for to-morrow morning I divided into two sections, not on account of its length, but in thinking about the Society during the year (and I suppose that is what I was intended to do) it seemed to me that certain things have come up about which the Society should think. Then I have a short general statement to make. I think we ought to consider the Harrison Narcotic Act. If the original act was difficult to live by, the act now pending in Congress, it would seem to me, not being a practicing physician, would be quite impossible to live by. You will find an article about that act in the *Journal of the American Medical Association,* to which I shall refer tomorrow. It seems to me a committee should be appointed to study those acts and give the members of Congress the opinion of this important organization concerning them.

The question of a whole-time secretary for the State Board of Medical Examiners is extremely important. At one time, perhaps, the secretary of the board served as a clerk to register those who had passed, but it has gone far beyond that now. There is a tendency for all persons, including physicians, to go all over the country. As I understand it, our board is one of the few boards legally authorized to enforce our Practice of Medicine Act. It is a great compliment the State has paid us, and it would appear there should be someone on the board in terms of continuity of service who could serve and convey information to the incoming boards.

I have come to apprehend, as I never have before, the amount of work and the detailed work the secretary of the State Society has to do, and I feel that before long we shall have to consider, as so many states have considered, the advisability and possibility of having a whole-time secretary. There are a good many things that could be done that the secretary cannot do now. His position is mixed up with other questions, among them the question of a state-owned medical journal. The president of

the Society is an incidental, ephemeral kind of thing, and the secretary is the man that holds it together. I think that is another thing we ought to consider.

There are other questions of this character which I do not think necessary to bore you with to-night. They will be stated to-morrow, and I only hope there will be enough information submitted to warrant the Society in appointing committees.

ANNUAL REPORT OF SECRETARY-TREASURER

L. B. McBrayer, M. D., F. A. C. P.

The secretary has performed all duties assigned to him by the House of Delegates and carried out all requests of the president.

Financial

The report of the financial transactions of this Society and of its secretary-treasurer are appended hereto, together with certificates from the Page Trust Co., showing balance in savings account and in checking account, which is submitted for your consideration. It will be remembered that when the present secretary-treasurer took over the work there was no money in the treasury and he was compelled to borrow money on his personal indorsement to finance the Society until the next year's dues were available, and it is only during the year now closing that we have been able to finance the Society's doings without borrowing money. Sufficient funds are now in the treasury for expenses for the coming year, based on policies of operation as of the previous year. Let me hasten to add that this financial condition was not brought about by or through any fault of former treasurers or former secretaries.

Membership

We are pleased to chronicle another slight gain in membership for the past year. When the Transactions went to press our total was 1657 against 1606 for the previous year, and several names were added after that date mentioned. We have a total membership at this writing of 1530 against a total of 1458 at last meeting. It seems that a goodly number just cannot remember to pay their dues.

Honorary Fellows

We now have 112 living Honorary Fellows and 9 have died during the year. There will be 2 or 3 more members added to the roster of honor this year, and within the next four years there will be added about as many as we now have.

When a member begins to near the time when he should become an Honorary Fellow, he begins to show more interest in "30 years of continuous membership" and in some cases, in fact in many cases, there are lapses in payment of annual dues as shown by the treasurer's book. We have written all who have these lapses and who have the possibility of becoming Honorary Fellows and called their attention to the lapse and suggested that they send check to cover dues or show receipt for payment. Many feel certain that they have paid these dues but only one has sent in receipts covering the period, while many have sent checks.

Again, certain ones feel sure that they were members before the time the treasurer's book shows they paid dues; among these are such men as Dr. Charles L. Minor, Dr. A. A. Kent, and your secretary. Article IV, Section 6, of our Constitution says: "The Honorary Fellows shall consist of such physicians as have been members of this Society continuously for 30 years, and whose dues have been paid during that time." I do not know of any authentic record as to payment of dues by a member except the treasurer's book, even if it were not correct 30 years ago, and so I shall continue to pay my dues until the treasurer's book shows that I have paid continuously for 30 years. Again let me say that this is not a criticism of any former treasurer, but a simple recital of facts that I thought might be of interest.

County Societies in Good Standing

Eighty-six county societies are entitled to send delegates to this House of Delegates. While our by-laws provide (chap. iv, sec. 2) that "Each component society . . . which has made its annual report and paid its assessment . . . . shall be entitled to one delegate," there are a number of county societies which make no report, and whose assessments to this Society are collected by our secretary. Indeed, we have eight with only one member in good standing in each county. It would seem that the societies in these counties, if by any stretch of the imagination they could be called that, should not be allowed representation in this House of Delegates, and yet we do want them for members of our State Society, or if they were not accepted as such they would suffer much inconvenience and loss, not being eligible to join any other district or national organization.

The following counties at this writing, June 10, 1926, have neither made their annual report nor paid their annual assessment, and are, therefore, not entitled to representation in this House of Delegates: Mitchell-Watauga, Rockingham, Stokes, and Swain.

Members House of Delegates

While we have made special request of every secretary, we have received certified roster of delegates from only 46 component societies (see roster back of program). Of course, according to law, no one has a right to be a member of this House of Delegates unless he was elected by his county society in regular session and proper certificate of same is forwarded to the secretary. We have always been exceedingly lenient about the enforcement of this law, and perhaps should be for a while longer, though it seems that so simple a business procedure as this should be properly attended to by the component societies, but probably it will not by many so long as we continue our magnanimity.

Liability Insurance

Your committee on this subject with power to act performed its duty and arranged with the Aetna to furnish this insurance to our members at a discount of some 28 per cent. (see report, page 116, Transactions 1925) over prevailing charges by insurance companies at that time. The total insurance now in force under this arrangement amounts to, for

any one claim, $2,470,000, and for any number of claims in any one year, a total of $7,320,000. This insurance is carried by 300 members and they save in annual premiums between $2,500 and $3,000, which is between one-half to two-thirds the total amount paid as dues by every member of the Society. If every member carried this insurance (and from the increasing number of suits being brought it will soon become a necessity if, indeed, it is not at this very moment), the total amount saved by our members in premiums would be more than $15,000, while the total amount of annual dues is now only $4,800, a saving of $10,200 over and above all the dues paid to this Society. This is a function of the Society as I see it, and while it has not heretofore been activated, yet it could be extended to other things such as automobile and, perhaps, accident insurance. In fact, the American Medical Association has secured a preferred classification for its members in one company that effects quite a saving in automobile insurance premiums. Such things should be followed up.

Called Meeting of Council

Because of an error in the election of Dr. M. L. Stevens at the last session and because we were entitled to an additional delegate, and because of our meeting this year in June instead of April, and because the American Medical Association met this year in April instead of June, it was necessary for us to elect two delegates and two alternates. The president, therefore, called a meeting of the council, February 16th at 7:30 P. M., at the Prince Charles Hotel, Fayetteville, for the purpose of electing two delegates and two alternates to the A. M. A. for the years 1926 and 1927, and the council elected:

Dr. W. D. James, Hamlet, and Dr. M. L. Stevens, Asheville, as delegates for the years 1926 and 1927, and Dr. D. T. Tayloe, Washington, and Dr. Wm. Ilan, Charlotte, as alternates.

The secretary of the A. M. A. later notified me that Dr. Tayloe was not eligible, as he had not been a member of the Scientific Assembly the required number of years. This election by the Board of Councilors should be approved by the House of Delegates. While on this subject, let me say that after the retirement of your present secretary it would be to the best interest of this Society and to the best interest of the A. M. A. and, therefore, to the best interest of the medical profession generally, to make your secretary one of your delegates to the A. M. A.

Change of Time and Place of Meeting

It was found that the time provided by your by-laws for our meeting coincided with the time of the 1926 meeting of the A. M. A. We had a communication from Secretary Olin West of the A. M. A. requesting us to change our date, if possible, as it was impossible to change the date of the meeting of the A. M. A. At the same time we had a request from the New Hanover County Medical Society to change the date to June 14-16 and the place to Wrightsville Beach. There seeming to be no provision made for such a contingency except by action of the House of Delegates, the president requested the secretary to put the matter up to the members of the House of Delegates by letter and request them to vote on the matter, which was done. All voting having voted in favor of

the change of time and place, save two who voted against, the president declared the time changed to June 14-16, and the place of meeting changed to Wrightsville Beach.

Medal for Original and Distinctive Work Offered Annually by the Moore County Medical Society

The Moore County Medical Society has set aside $500 and desires to use the income from the same for the purchase of a medal to be presented annually for the best original and distinctive work done in medicine during the year, which period shall begin and end with the annual meeting of the Medical Society of the State of North Carolina. This medal shall be known as the "Moore County Medical Society Medal for Original and Distinctive Work in Medicine." The Moore County Medical Society requests that the Medical Society of the State of North Carolina appoint a committee of three, one of whom shall be a member of the Moore County Medical Society and two of whom shall be selected from the past presidents of the Medical Society of North Carolina. This committee shall formulate all rules governing the award of this medal, and shall make all awards, provide all medals, and report to each annual meeting of the Medical Society of the State of North Carolina. The Moore County Medical Society desires that the work of men in all and every phase of medicine be considered in making the award.

Invitations for Next Annual Meeting

Invitations have been received from the Moore County Medical Society to hold our next annual meeting at Pinehurst, and from the Buncombe County Medical Society to hold our next meeting at Asheville. There probably will be other invitations extended.

The Whole-Time Secretary

As I shall not accept the office of whole-time secretary if such office should be created and tendered me, it has occurred to me that it would not be a breach of the proprieties for me to say a few things in regard thereto; in fact, it would be wise to do so.

The duties and work of the office have grown out of all proportion to the growth of the Society numerically, and should continue to grow. The work of the office if properly done consumes much time, labor and thought. It would be strange if it did not.

There are many other things that the Society could do. For example: A few state societies have two or more employees who devote their whole time to a health program conducted by the local societies in coöperation with other organizations, having liaison with all organizations doing any kind of health work. Not a bad idea, and in these states using it, it seems to be working well. I will not go further into the pro of this matter, for there is a committee to report on it. However, if a whole-time secretary is employed, I trust this Society will have the wisdom to pay him a sufficient salary to make it possible for a capable man to accept the place, and that, of course, means an increase in dues. There are only a very few societies whose dues are as low as ours and none lower; some are as high as $20.00 or $25.00. What effect will the raising of dues to from two and one-half to four time the present rate have on

our membership? I can tell you that it has taken no small amount of thought and labor to increase our membership from 1087 in 1918 to 1657 in 1925. We ought to have some 300 more members than we have, and I shouldn't like to do anything to lop off 500 or 600 of them.

At any rate, let me say that while my term of office does not expire until the 1927 meeting, in case the Society wants to arrange for a whole-time secretary, either at this meeting or by committee during the recess, I shall be glad to tender my resignation to take effect at such time as may best suit the arrangements that may be made. It would be neither convenient nor satisfactory to me to devote all my time to this work. Let me say, though, that the work of the secretary's office has been a labor of love, and it has been a pleasure to do what I could in this way for the benefit of this Society and our profession.

All of which is respectfully submitted.

(Signed) L. B. McBrayer,
Secretary-Treasurer.

FINANCIAL STATEMENT

April 24, 1925, to June 9, 1926

RECEIPTS

Balance April 24, 1925	$ 600.35
Dues collected	5,197.50
Sale of Transactions	35.50
Chairman Committee Arrangements, refund registrar expenses	40.75
Dr. J. W. Long, 1 daylight lantern, etc.	227.10
Dr. J. W. Long, printing N. C. Section Am. Col. Surgeons	303.60
Transferred from Savings	3,000.00
Interest on above	52.00
Total Receipts	$9,456.80

DISBURSEMENTS

Check No. 278	—D. G. Stutz, express on lanterns	$ 2.79
" " 279	—Commercial Printing Co., 2,700 programs	94.00
" " 280	—Mary Bulla, Salary, April	135.00
" " 281	—Foss & Morris, 2M envelopes, 12 placards	19.85
" " 282	—Dr. John C. Tayloe, refund dues	10.00
" " 283	—Miss Mary Slater, clerical work	3.75
" " 284	—Dr. J. A. Dimmette, refund dues	3.00
" " 285	—Western Union Tel. Co., April acc't.	12.77
" " 286	—Dr. F. R. Taylor, expense Councilor	30.00
" " 287	—City Telephone Co., April acc't.	1.80
" " 288	—Pinehurst, Inc., hotel for registrar	19.00
" " 289	—Pinehurst, Inc., hotel for reporter	25.00
" " 290	—Eunice Bulla, hotel for registrar	12.00
" " 291	—Eunice Bulla, office work	8.00
" " 292	—Trans-Lux Screen Co., Inc., 3 screens and 3 carrying cases	128.25
" " 293	—Bausch & Lomb Optical Co., 2 Balopticans and 3 tripods	216.00

"	"	294—Dr. L. N. West, refund dues	9.00
"	"	295—Dr. John S. Hooker, refund dues	6.00
"	"	296—Miss Mary Robinson, travel, 3 days reporting	54.16
"	"	297—Western Union Tel. Co., May acc't.	1.74
"	"	298—Foss & Morris, certificates of election of officers	10.25
"	"	299—City Telephone Co., May acc't	.65
"	"	300—D. G. Stutz, express	.95
"	"	301—A. M. A., 2 copies "Ethics"	.20
"	"	302—Dr. E. T. Dickinson, refund dues	2.00
"	"	303—Mrs. N. S. Fisher, clerical work	20.00
"	"	304—Miss Mary Robinson, on account reporting	75.00
"	"	305—Dr. L. H. Justis, refund dues	3.00
"	"	306—Dr. W. R. Putney, refund dues	3.00
"	"	307—Western Union Tel. Co., June acct.	6.87
"	"	308—Dr. H. T. Pope, refund dues	3.00
"	"	309—Mitchell Printing Co., letterheads and envelopes	50.00
"	"	310—City Telephone Co., June acct.	.70
"	"	311—Dr. John H. Hamilton, refund dues	3.00
"	"	312—Dr. Abel Anderson, refund dues	3.00
"	"	313—Miss Mary Robinson, on account reporting and work on TRANSACTIONS	50.00
"	"	314—Mrs. D. R. Perry, room and board, asst. editor	51.00
"	"	315—Miss Mary Slater, clerical work	22.40
"	"	316—Mrs. N. S. Fisher, clerical work	40.00
"	"	317—Master Reporting Co., reporting Pinehurst meeting	426.20
"	"	318—Mary Bulla, salary July	135.00
"	"	319—D. G. Stutz, express TRANSACTIONS copy	2.91
"	"	320—Miss Mary Robinson, balance on reporting and work on TRANSACTIONS	121.87
"	"	321—Western Union Telegraph Co., July acct.	3.07
"	"	322—City Telephone Co., July acct.	.55
"	"	323—D. G. Stutz, express copy	1.19
"	"	324—Mary Bulla, postage and postals	2.19
"	"	325—D. G. Stutz, express from Mrs. Hays	.43
"	"	326—L. B. McBrayer, salary for seven months	350.00
"	"	327—Western Union Tel. Co., August acct.	.54
"	"	328—Mary Bulla, postage	7.00
"	"	329—Southern Stamp & Stationery Co., 1 rubber stamp	.85
"	"	330—D. G. Stutz, express TRANSACTIONS	1.68
"	"	331—Western Union Tel. Co., October acct.	.96
"	"	332—Western Union Tel. Co., back acct.	.30
"	"	333—Brown Morrison Co., 1700 copies 1925 TRANSACTIONS	2,427.00
"	"	334—Brown Morrison Co., postage and labels for TRANSACTIONS	251.00

"	"	335—Foss & Morris, 1M membership report blanks	15.00	
"	"	336—Brown Morrison, express and cuts	85.68	
"	"	337—D. G. Stutz, express	6.30	
"	"	338—Brown Morrison Co., 3M copies Constitution and By-Laws	95.00	
"	"	339—Foss & Morris, 2M membership cards and cut of signature	12.50	
"	"	340—L. B. McBrayer, salary five months	250.00	
"	"	341—N. C. Tuberculosis Asso., postage	83.53	
"	"	342—Void		
"	"	343—Mitchell Printing Co., envelopes	3.00	
"	"	344—Mary Bulla part salary 1 month	35.00	
"	"	345—Void		
"	"	346—Mary Bulla, balance on salary	100.00	
"	"	347—Mary Bulla, postage	.50	
"	"	348—Western Union Tel. Co., April acct.	.40	
"	"	349—L. B. McBrayer, salary May and June	100.00	
"	"	350—Mary Bulla, postage	3.60	
"	"	351—Dr. Paul F. Whitaker, refund dues	3.00	
"	"	352—Mary Bulla, May salary	135.00	
"	"	353—Dr. E. P. Norfleet, refund dues	3.00	
"	"	354—Dr. L. B. Evans, refund dues	3.00	
"	"	355—Western Union Tel. Co., May acct.	14.43	
"	"	356—N. C. Tuberculosis Ass'n, postage	80.38	
"	"	357—Mary Bulla, 2 boys help mail out programs	.50	
"	"	358—Maitland Grover, help mail programs	1.00	
"	"	359—Morris Eadie, mail out programs, office work	5.00	
"	"	360—Page Trust Co., certificate of deposit	3,000.00	
		Checks returned	72.00	$8,977.69
Balance June 9, 1926				$ 479.11
Checks outstanding:				
		97	$ 1.00	
		351	3.00	
		353	3.00	
		354	3.00	
		355	14.43	
		357	.50	
		358	1.00	
		359	5.00	30.93
Balance per Page Trust Company, June 9, 1926				$ 510.04

DISTRIBUTION OF EXPENSES

Refund dues	$ 54.00
Postage, express, telephone, telegraph, etc.	238.23
Programs, stationery, membership cards, office supplies, etc	205.65
Reporting Pinehurst meeting and editing TRANSACTIONS	778.23
Printing and mailing 1925 Transactions	2,858.68
Salary Secretary-Treasurer	700.00

Salary stenographer and extra clerical help	640.65
Travel expense Councilor Eighth District	30.00
Daylight screens and lanterns	344.25
Expenses registrars Pinehurst meeting	56.00
Checks returned	72.00
Transferred to savings account	3,000.00
	$8,977.69

Aberdeen, N. C., June 9, 1926.

THIS is to certify that Dr. L. B. McBrayer, Secretary-Treasurer of the Medical Society of the State of North Carolina, has on deposit with this institution $3000.00, bearing interest at the rate of 4 per cent., as evidenced by our Certificate of Deposit No. 1557 issued this date.

PAGE TRUST COMPANY,
By BEN S. OLIVER, *Assistant Cashier*

Aberdeen, N. C., June 9, 1926.

THIS is to certify that Dr. L. B. McBrayer, Secretary-Treasurer of the Medical Society of the State of North Carolina, has on deposit in this institution in checking department $510.04 as of this date.

PAGE TRUST COMPANY,
By BEN S. OLIVER, *Assistant Cashier*

PRESIDENT WM. DEB. MACNIDER:

I can not refrain from making one statement. It seems to me the action of the Moore County Medical Society is one which we should commend. The action of any individual or any organization which even thinks about encouraging advance in medical thought is a fine thing, and when they have it enough at heart to put their hands in their pockets and raise $500, the interest on which shall be used to indicate what man has done well in his medical thought, that is surely a most commendable action on the part of any organization.

Dr. A. J. Crowell moved that the report of the Secretary-Treasurer be received, and that the House of Delegates extend its sincere thanks to the Moore County Medical Society for its offer to bestow this medal. Motion seconded and carried.

The financial part of the Secretary-Treasurer's report was referred to a committee on finance appointed by the President, none of the members of the regular committee being present. The President appointed the following Committee on Finance: Dr. John B. Wright, Dr. C. V. Reynolds, Dr. Foy Roberson.

REPORT OF COMMITTEE ON PUBLIC HEALTH ADMINISTRATION

Dr. J. Howell Way, Chairman, stated that the committee had no report to make at the present time, but desired merely to call attention to the fact that the Medical Society of the State of North Carolina has defined public health work, and also to the fact that public health work should be sanctioned by and should be conducted in harmony with the views of the societies of the respective counties.

REPORT OF COMMITTEE TO CONSIDER MAKING "SOUTHERN MEDICINE AND SURGERY" THE JOURNAL OF THE SOCIETY.

Dr. Charles O'H. Laughinghouse, Chairman, read the following report:

Your committee to which was referred the question of the advisability of making "Southern Medicine and Surgery" the official organ of the State Society, as per a proposition made at the 1925 session (for details of which see page 116, TRANSACTIONS of that year), begs to report as follows:

First: An official journal could morally require all papers read before the Medical Society of the State of North Carolina to become the property of the journal.

Second: In the event such requirement were made, it would deprive the writers of papers of the privilege of selecting sources of publication in which they might prefer their articles to appear.

Third: The dues paid by the members of the Medical Society of the State of North Carolina include a bound copy of its TRANSACTIONS. Should we accept the proposition as submitted, it could do away with the TRANSACTIONS. The TRANSACTIONS, to our minds, are recording in permanent form the medical history of the state. They are very useful and cannot be dispensed with except at a sacrifice of permanent record and convenient reference.

Fourth: The proposition as presented to this committee would increase the dues of the State Medical Society. As it now stands this journal can be secured by any man in the state who wants it, with no additional cost to the Society.

Fifth: As it now stands the journal has the privilege of procuring the papers read before the State Medical Society.

We recommend that the proposition as presented be not accepted.

(Signed) CHAS. O'H. LAUGHINGHOUSE, *Chm.*
C. A. SHORE,
C. V. REYNOLDS,
Committee.

A motion to adopt the report was duly seconded, and the report was discussed by Dr. H. A. Royster and Dr. J. W. MacConnell. The motion to adopt was carried.

REPORT OF COMMITTEE TO INVESTIGATE THE GLASCOCK-WAKE COUNTY CONTROVERSY

Dr. J. M. Parrott, Chairman, stated that the committee had been unable to function largely because of the illness of the chairman, but that it would continue to serve, if the House of Delegates so desired, until it could make a full and complete report. The committee was continued.

PROPOSED AMENDMENT TO BY-LAWS

The following proposed amendment was offered by Dr. J. M. Parrott:

CHAPTER XIV

Section 14. Membership in the State Medical Society and the American Medical Association is regularly obtained through membership in constituent societies, and every reputable and legally registered white physician who is practicing or who will agree to practice nonsectarian medicine shall be entitled to membership. The applicant shall be elected to membership by a majority vote of those present at any regular meeting, or the applicant may be elected by a called meeting after ten days' notice has been given to each member of the Society. Should a physician be refused membership in his component county society, he may appeal his case to the Councilor of the district in which he resides; and either party (applicant or county society) may appeal the case from the decision of the Councilor to the Board of Censors of the State Society (such Board of Censors to be composed of the Councilors from the Councilor Districts sitting collectively) after not less than ten days' notice to each member of the Board of Censors, such notices to be furnished by the appellant. Should the Board of Censors, after hearing the case (at which hearing may be submitted evidence both oral and written and made reliable and dependable in such manner as the Board of Censors may deem best), decide that the applicant be worthy of membership in the County Society; and should the Board of Censors, after making reasonable effort to do so, fail to reconcile the County Society to the acceptance of the applicant; then in that event, if the applicant so elects, he, by giving ten days' notice through the County Society of such a meeting, stating date, hour and place, may resubmit has case to the County Society and be accepted as a member of the County Society by not less than a two-fifths vote of the members present and voting. In the event three-fifths or more of the members present and voting reject the applicant, then he shall not be a member of the County Society.

The House of Delegates, through whatever machinery it may deem best and wise, may impose such a penalty as it may think just and fair upon the County Society for refusing to obey its mandate in matters of appeal by an applicant, or about any other matter over which it, the House of Delegates, has jurisdiction.

Provided further, that in a County Medical Society in which there are fewer than ten members at the time the application for membership of the physician is made, the vote for acceptance after appeals, as indicated above in this section, shall be not less than one-fifth of the members present and voting.

Before a charter is issued to any County Society full and ample notice and opportunity to become a member shall be given to every physician in the county entitled to membership.

The application of no physician shall be voted on for membership within three months after rejection.

All sections and parts of sections of the by-laws in conflict with this section are now declared repealed and void.

It was moved that the proposed amendment be referred to a committee, and the President appointed Drs. J. M. Parrott, Charles O'H. Laughinghouse, and Cyrus Thompson to serve as the committee.

REPORT OF DELEGATE TO AMERICAN MEDICAL ASSOCIATION

Dr. A. J. Crowell, Delegate, made the following report:

Dr. Stevens and I attended the last meeting of the American Medical Association at Dallas. The same thing to which Dr. Parrott referred in introducing his amendment to the by-laws came up there. Someone has found, whether by reason of the trouble in this Society or some other state society, that there is no penalty laid on the county medical society for refusing to obey the command of the state medical society, and the opinion is that there should be some penalty if the county medical society is determined not to admit a worthy person, because the county society is the portal through which a person may enter the state society and the national organization. The suggestion, however, was voted down.

This report was discussed by Dr. J. Howell Way.

REPORTS OF COUNCILORS

Second District—Dr. G. G. Dixon, Councilor.

The Second District has the best district society and the best component county societies of any district in the state. Seven of our county societies meet regularly once a month, and our district society meets once a year. The meeting is always well attended, and we have good scientific papers.

Fourt District—Dr. J. C. Grady, Councilor

I wish to report that the Fourth District Society is moving forward nicely. We have a meeting regularly every three months with strong attendance and usually most excellent papers on the prevailing disease of the district at that particular season of the year. I do not hesitate to state that the Fourth District Society is in most excellent condition and growing better and better at every meeting. During the year it has been my pleasure to visit five of the seven counties comprising my district, and I should have been pleased to visit the other two but failed to get any response to various letters written, requesting the time and place of meeting in those two counties. They being rural counties, I realized it was almost impossible to get a called meeting on short notice because of the members being widely scattered.

Johnston County. The first visit was naturally made to my home county society, which I visit of course as often as circumstances will permit. At our March meeting Dr. Oliver of Benson suggested the appointment of a committee to revise our fee bill and at the same time devise some plan by which we all might better coöperate each with the other in the collection of our fees. The suggestion of Dr. Oliver met with hearty approval and was adopted by the society, the president being authorized to appoint the committee. The appointment was made and the committee is now at work on the plan, but has not as yet made a final report to the society. Our scientific papers are always good and are freely discussed by the members. Dr. W. J. B. Orr, our president, seems to be making a special effort to inject a large dose of "pep" and "ginger" into our society, and from all appearances he is succeeding

wonderfully. We have in Johnston County 24 regularly practicing physicians and our membership roll includes the entire number. I say without the slightest hesitation that we have a county medical society in Johnston County which is far above the average.

Wayne County. The second county medical society I visited was Wayne, a neighboring county and society, and to my pleasure found them in excellent condition, thoroughly alive to the important medical topics of the day. This society has a membership of approximately forty. I found all but two of the members in open revolt against Dr. G. M. Cooper. I made an effort at this meeting to pour oil on the troubled waters, but at the close of the meeting I felt satisfied that I had not succeeded. I did succeed, however, in enjoying a most bountiful feed, which I understand is a part of the program at every meeting. The meeting closed with seemingly a strong determination to fight some of the methods of "State medicine" to the last ditch. But for "pep" and enthusiasm I am compelled to say that Wayne is far ahead of any other society in the district, due perhaps in large measure to the untiring efforts of its most efficient president, Dr. W. H. H. Cobb.

Edgecombe County. It was my pleasure to be present at the Edgecombe County Medical Society's meeting held in Tarboro in April. I found there a most excellent and flourishing society, under the leadership of Dr. Green as president. They had practical and scholarly papers dealing with various scientific subjects, all of which were thoroughly discussed by the members. Here again I enjoyed a good feed, and a thoroughly functioning medical society. I must say that the Edgecombe County Society is composed of about as good a bunch of regular fellows as it has been my pleasure to meet in many days. Perfect harmony prevailed, and the Eighteenth Amendment was not even mentioned during the entire meeting.

I was instructed by the Edgecombe Society to take up the matter of hospital fees and other fees in general with the Fourth District Society at their next meeting, in order that there might be more uniformity in the fees of the various hospitals in the district and the state, also in the minimum charges which should be made for certain classes of work. I did this at the Weldon meeting, and a committee was appointed to investigate and make a report.

Wilson County. Next it was my pleasure to visit the Wilson County Medical Society, and, as last year, they were well organized and in admirable condition. There were several wonderful papers read and a very free and general discussion afterwards. I am informed that they have these papers and discussions as a part of their regular program. The Wilson County Medical Society is composed largely of young men who show promise of a most wonderful future. Wilson enjoys a wonderful hotel for the small city that it is, and it was here that a delightful banquet was held. The county society enjoys a banquet following each and every meeting.

Halifax County. In May it was my pleasure to visit the Halifax County Society and at the same time a meeting of the Fourth District Society, the district society being the guests of the county society at that time. Halifax has a fine and wide-awake society under the leadership of Dr. Long of Roanoke Rapids. At the close of the meeting of

the Fourth District Medical Society Dr. Long called to order the meeting of the Halifax County Society. They elected new officers for the ensuing year, and from all appearances it will be a happy and prosperous year for the Society. At the close of the two meetings we repaired to the banks of the "Old Roanoke", where we had the extreme pleasure of participating in that famous Halifax County dish known as "rock muddle" (the first I ever saw) together with barbecue and soda pop. I have no comment to make other than that it was thoroughly enjoyed by all, without a single complaint. A feature of the meeting that further enhanced the pleasure and interest of the occasion was the fact that the Kiwanis Club was in conjoint session with us and had a very substantial if not a major part in furnishing the refreshments. Afterwards they put on a burlesque on the doctors and the patent medicine vender, not to be surpassed.

Nash County. My last visit was made to the Nash County Medical Society at their June meeting. The meeting was presided over by the President, Dr. Lane, and immediately after the reading of the minutes we proceeded to enjoy a sumptuous feast which was served at the Ricks Hotel. I am informed that this is a part of their regular program at every meeting. Owing to the inconvenient train schedule it was necessary for me to leave at the end of the feast and before the papers were read. It was certainly thoughtful of the society to have the feast first so that I might enjoy it with them. I was exceedingly regretful that circumstances prohibited me from hearing the papers read and discussed, but knowing the boys as I do I am not hesitant to state that they had very good papers and a free and general discussion, and then you know we had already enjoyed the feed. However, during my short stay I learned that they had a membership of thirty-eight and that they meet regularly. It was easy to note the pep and enthusiasm in this society and see that they have a live wide-awake Society in Nash.

Sixth District—Dr. V. M. Hicks, Councilor.

It is my pleasure as Councilor of the Sixth District to report splendid progress in medical organization during the past year. As was stated in last year's report, it has been our hope sometime to have two meetings of the district society instead of the annual meeting. This program took definite form at the annual meeting of the district in Chapel Hill, June, 1925. Upon recommendation and motion of the Councilor it was decided to have a fall and spring meeting of the District Society.

The Chapel Hill meeting was splendid. Dr. Beverly Tucker of Richmond, as honor guest, led a very instructive scientific program. Dr. James M. Parrott of Kinston was also a guest. The social feature of the meeting was fine, and everyone enjoyed being at the university.

The fall meeting was held at Burlington on December 10th. Dr. J. R. Parker, President, presided. A varying program of eight papers was presented with full discussion. The scientific program was followed by a banquet given by the Alamance County Society.

The spring meeting was held at Wake Forest on May 11th. Dr. Stuart McGuire led the scientific program, which consisted of four splendid papers. This was followed by a dinner tendered by the Wake County

Medical Society. This meeting was largely attended, and the society felt indebted to Dr. Thurman Kitchin and Dr. W. L. Poteat in arranging this pleasant day.

The Councilor feels that a great forward step has been taken in medical organization in the Sixth District by having semi-annual meetings, and interest is running very high.

The county units are working about as usual. Irregular meetings are being held and efforts are being made to have two or more good meetings in each of the smaller counties each year.

Seventh District—Dr. T. C. Bost, Councilor.

The annual meeting of the Seventh District Medical Society was held in Gastonia, October 6, 1925. This was a very interesting and instructive meeting. Eighteen papers were read and fully discussed. Over a hundred members were present. Dr. Wm. deB. MacNider, president of the State Medical Society, was present and made a very instructive talk. A banquet was given to the society by the Gaston County Medical Society, which was greatly enjoyed and highly appreciated by the members. Dr. Chas. H. Pugh, Gastonia, was elected President; Dr. E. B. Lattimore, Shelby, Vice-president, and Dr. Raymond Thompson, Charlotte, Secretary. The next meeting will be held in Shelby in October, 1926.

I have visited all of the county medical societies in the district and find that they are all organized and are holding regular meetings except in Anson and Lincoln Counties. These counties are organized but do not seem actively functioning, owing to a small membership. Lincoln County and two adjoining counties have formed a tri-county society, which holds regular meetings. The members of the Anson County Medical Society attend meetings in the surrounding counties. Most of the counties have a comparatively small membership, except Mecklenburg and Gaston, but practically all of the doctors in the district belong to their county societies.

Dr. B. L. Talley and Dr. E. P. Brunson, of Albemarle, were expelled from the Stanly County Medical Society in June, 1926, for irregular practice. Otherwise no irregular practice or other difficult problems have come to my attention.

A spirit of harmony and coöperation prevails among the men, and much interest has been shown in the medical societies during the year throughout the district.

Eighth District—Dr. F. R. Taylor, Councilor.

Last year I made a detailed report of conditions as I found them in my first year's experience as councilor. In order to save your time, I shall therefore report this year not so much on the detailed conditions existing in the district as on the progress, or otherwise, made in the several counties of the district during the past year.

Wilkes County. While I found it impracticable to make satisfactory arrangements to attend a meeting of the Wilkes County Medical Society the past year, a conference with Dr. Frank Gilreath, president of the society, proved most gratifying. From him it was learned that the reawakening of activity in Wilkes noted at the end of my last year's report on that county has continued. Wilkes meets whenever it seems practic-

able for the members of the society to get together. Factions still exist, according to Dr. Gilreath, but they no longer paralyze the work of the county society, and there is a marked improvement in the whole situation. One man practicing in Wilkes who has heretofore kept his membership in another county society recently promised Dr. Gilreath and myself to seek a transfer of his membership to Wilkes, where we feel he should belong. In short, Wilkes has shown a very definite advance from a society that had been practically latent for nearly two years to one that is now actively at work, and that has been so for over a year. It does not seem too much to say that Wilkes has shown the greatest progress of any county society in the district during the past year.

Yadkin County. There are still nine physicians in the county, one not being in practice. One doctor has moved out of the county and another moved in. Dr. Harding of Yadkinville reports that he made every effort to start up society activity in Yadkin, but that the doctors of the county are so scattered in location that it is impossible to get them together. There is some talk of one or two more men moving to Yadkinville. If they do, this will give a greater concentration of physicians in one place, and may help to begin future developments.

Alleghany County. According to Dr. B. O. Choate, who was interviewed, there is a satisfactory degree of harmony in the profession of Alleghany now. The work of certain colored midwives in the county is causing some concern, according to Dr. Choate, as they seem to have little or no aseptic technic, and the doctors are too often called in only after infection has developed. There being only three doctors in Sparta, no attempt has been made by them to work up a county society, but the doctors are much interested in attending the State Society meetings whenever possible.

Surry County. A conference last September with Drs. Garvey and Salmons revealed the fact that all the Surry meetings were at that time being held in Mt. Airy, as the Mt. Airy physicians seemed to find it increasingly difficult to come to Elkin. The Elkin physicians seemed to find the same difficulty in going to Mt. Airy, so this change resulted in less interest being taken by the Elkin men in county society work than was taken by them in the past, when the meetings were divided between Mt. Airy and Elkin. There is no split in the profession; the Elkin men simply find it difficult to go so far to meetings. Interest in district work as a whole is as active as ever in Surry. I was informed that there was one man in Elkin who is not licensed to practice any school of healing, who treats cancer with plasters and charges for his services. This matter was brought to the attention of one of the members of the State Board of Medical Examiners.

On May 6, 1926, the district society meeting was held in Elkin. It was a good meeting and was very well attended. Dr. C. A. Shore of Raleigh was present as a guest and gave a talk on rabies. Dr. F. M. Hanes of Winston-Salem gave an especially interesting talk on his recent trip to British East Africa. A splendid dinner and entertainment was given the society by the Elkin Kiwanis Club. The officers elected for the ensuing six months were: President, Dr. W. C. Ashworth, Greensboro; Secretary, Dr. D. W. Holt. Greensboro was selected as the next meeting place.

Stokes County. Stokes is still facing the almost insoluble problem of too few doctors to keep up regular county society work. Since my visit last year two physicians, including the president of the Stokes County Society, have moved out of the county, and one physician in the county has died. One has moved into another county. There seems to be no place with more than two members in the county society, and the average distance between any one member or group of two members and the next nearest member is about 20 miles. The plan attempted last year of attending meetings of the Forsyth County Society did not prove successful. There are very few doctors in all of Stokes County, and only five of them seem interested in county society work, according to Dr. Stone of King, who was interviewed. He also reported that two physicians in King rather frequently attend the staff meetings of the Lawrence Hospital in Winston-Salem, and derive much benefit therefrom.

Rockingham County. On October 3, 1925, the district meeting was held at Reidsville, instead of at Wentworth Court House as originally planned. An excellent program was provided. There were two notable guests of honor, Dr. Stuart McGuire of Richmond, Va., and Mr. W. M. Hendron of Winston-Salem, President of the North Carolina Bar Association. Dr. McGuire read a splendid paper on gall-stones, and Mr. Hendron gave a very brilliant address on forensic medicine. The papers read by the members of the society were also of a high order. After the scientific meeting, which was held in the auditorium of the high school, the class in home economics of the school served a most enjoyable banquet, accompanied by an excellent musical entertainment, including a remarkable two-part song sung by a group of very small children. Elkin was selected as the next meeting place of the society, and Drs. Salmons and Royal, both of Elkin, elected President and Secretary, respectively, of the society.

Rockingham County seems to have kept up the gratifying work of last year and is exhibiting a spirit of harmony, coöperation, and progress.

Randolph County. Drs. Hayworth and Lambert were interviewed in Asheboro in May of this year. Dr. Hayworth is listed in our 1925 Transactions as President of the Randoph County Medical Society, but he informs me that this is a mistake, and that Dr. C. C. Hubbard is still president, owing to the fact that no meeting for the election of officers has been held the past year. In other words, Randolph has taken a rather bad slump, but there are signs that seem to indicate a speedy re-awakening of interest. Dr. Lambert, Secretary of the Randolph Society, agreed to call a meeting for June at which officers and delegates should be elected and plans made for work during the ensuing year.

Ashe County. Ashe seems to be still having trouble over practitioners who are said to be not properly qualified. I was informed last summer by one of the regularly qualified practitioners of the county that not only were some of the limited-license men abusing their privileges, by practicing outside of the territory assigned them, but that two men had recently located in Ashe County who had failed to obtain a license from the State Board of Medical Examiners when they went before it; they had simply located and started practice illegally in the county. This

matter had already been brought to the attention of the secretary of the State Board of Medical Examiners, and to that of at least one other member of the Board.

Forsyth County. Forsyth continues to do very high grade work in the activities of its county society, as might be expected from the large number of members and the excellent facilities in the county for working out medical problems.

On June 23, 1925, the district meeting was held in Winston-Salem. An excellent program was given, followed by a banquet and musical entertainment of great excellence at the Robert E. Lee Hotel. Dr. Wm. deB. MacNider, president of the State Society, attended the scientific meeting, to the pleasure and profit of all present. Wentworth Court House in Rockingham County was selected as the next place of meeting, and the following officers elected: President, Dr. J. W. McGehee, Reidsville; Secretary, Dr. S. G. Jett, Reidsville.

Guilford County. Guilford has done some good work during the past year, but on the whole there seems to be rather less interest and activity than were displayed the preceding year. The plan adopted last year by which four meetings a year are held in High Point, instead of two, while a much needed reform, has failed to stimulate the interest of the members as it should. The net result of the plan so far seems to be that there is fairly good attendance of High Point men at two more meetings a year than formerly, and of Greensboro men at two fewer meetings. With the excellent road connecting the two cities, it seems that this state of affairs can be explained only by a lack of interest and of a sense of individual responsibility on the part of a large number of members. Fortunately, there is a group of loyal men who, though relatively few in number, have carried on despite these odds and kept up an actively working society.

A further unfortunate lack of interest in scientific medicine on the part of the bulk of the Guilford profession is evidenced by the fact that this year, for the first time, the university extension authorities found themselves unable to organize two separate post-graduate courses in medicine in the two cities of Greensboro and High Point, because there were too few applications for membership in the classes. A single class from the county as a whole has been organized to meet at the county tuberculosis hospital at Jamestown, but even this took much hard work on the part of the university organizers and a few members of the Guilford County Medical Society coöperating with them.

Despite all these unfavorable factors, however, many excellent papers and discussions have been presented before the county society. Perhaps especially noteworthy were the papers and demonstrations by three members of the Crowell Clinic of Charlotte, who appeared before the society by invitation; a visit and talk by Dr. MacNider, an oration by Dr. Cyrus Thompson, and a series of moving pictures exhibited by Dr. J. W. Tankersley of Greensboro, showing his own operative technic in connection with spinal anesthesia.

In conclusion, it is rather difficult to sum up the work of the district as a whole. Some of the sparsely settled counties have remained inactive through little or no fault of their own. Some counties have shown definite constructive progress. Some have fallen back somewhat, and some

have maintained their previous high standards of work. There is much to be grateful for but much more to be worked for. One of the most pressing needs of some of the rural counties is adequate hospital facilities. It is to be hoped that through the munificence of the Duke Foundation and other interests the consolidated county hospital will soon be as mighty a factor in every rural county of our state as are our consolidated schools. This, it seems to me, is the *sine qua non* of the solution of the rural medical problems.

Tenth District—Dr. Wm. J. Hunnicutt, Councilor.

Since the last annual meeting of the State Medical Society we have held two district meetings in the Tenth District, one in the fall of 1925, one in the spring of 1926.

Our fall meeting was held with the Haywood County Medical Society at Canton on September 15, 1925. As usual, this meeting was well attended, about seventy-five physicians being present and demonstrating their enthusiasm in the same old way. The papers were of high order and provoked interesting discussion. Our honored president of the State Society, Dr. Wm. deB. MacNider, was present and delighted us with a very interesting and pleasing lecture on veratrum viride, a very potent drug when thoroughly understood and its therapeutic application intelligently made. A new feature of scientific work was inaugurated at this meeting, growing out of a very interesting paper read by Dr. Frank Howard Richardson, of Brooklyn, N. Y., and Black Mountain, N. C. The object was to do some post-graduate work in the form of clinics conducted by the members of the Tenth District. A committee was appointed at this meeting to work out the details and put it into effect at our next meeting. This being our annual meeting, officers were elected for the ensuing year, Dr. J. R. Davis of Canton being elected president, and Dr. J. LaBruce Ward of Asheville, secretary. We were royally entertained by the doctors of Canton, a good and appetizing dinner being served at the hotel, after which the visitors were divided into sections, with a guide for each section, and were escorted through the extensive plant of the Champion Fibre Company.

The society accepted an invitation from the Jackson County Society to meet at Sylva in the spring. However, owing to the condition of the highway, which was under repair at the time, by unanimous consent it was decided to hold the meeting at Waynesville on May 5, 1926. This meeting was also well attended, about one-half of the counties being represented. The meeting was held in the school auditorium and the banquet served in the dining hall of the new Methodist Church by the ladies of the church. I am glad to note here that we had in attendance two physicians who had been practicing medicine for fifty years, Drs. J. R. Ferguson of Haywood County and H. B. Weaver of Buncombe County. Dr. W. S. Rankin was our honored guest and after supper delighted us with a masterful exposition of the plans and purposes of the Board of Directors of the Duke Endowment as touching hospitals. Dr. Rankin is a lucid and forceful speaker, and I am sure all who heard him, both lay and professional, enjoyed and were benefited by his address. Dr. J. Howell Way, in his pleasing and affable manner, presented Dr. Rankin to the society, stating that Dr. Rankin really needed no introduction to

a North Carolina audience. Our honored and beloved secretary, Dr. L. B. McBrayer, was with us by special invitation. It is needless to say that we are always glad to have Dr. McBrayer with us, for he is one of our own boys and is always welcome among us at any time. Our program consisted of the usual high class papers, and a clinic on the heart conducted by Drs. Abel, Frazer, and MacRae. Dr. Liebman of New York, who was at that time visiting in the mountains, was present by invitation and gave us a very interesting lecture on pain.

Our district meetings are well attended by the ladies, a feature we are cultivating, and we feel proud of the interest which the physicians' wives and daughters are taking in our work and enjoyment.

I visited the McDowell County Medical Society twice, in company with a few of the Asheville doctors. One meeting was held at Marion and the other at Old Fort. Every physician in McDowell County was present, and both were enthusiastic meetings. This county is doing good work and meeting regularly, and I am sure the members have paid their dues and will be represented at this meeting.

Henderson County is a live wire. Some new members have been admitted and have taken up the work in earnest. I met this society in two meetings by invitation, and gave the best encouragement at my command. Along all lines they are a live and wide-awake bunch, and I am sure they will be represented at this meeting.

Haywood County is in good working condition. Having had both district meetings the past year gives them quite an incentive to go forward.

Buncombe County has the largest membership in the district, having more than one hundred members. The society holds meetings twice each month and is active in all matters pertaining to the health and welfare of its citizens. Three members have been expelled from the society as a result of legal proceedings and findings of the court against them for violation of the Harrison Narcotic Act. One member had his license revoked by the State Board of Examiners.

I am sorry I cannot make a full report of each county in my district, as I had intended, but a forced retirement from active work for three or four months frustrated my plans. I endeavored to retrieve the loss of personal touch by correspondence and have written many letters and urged the things I meant to carry to them personally. If not providentially hindered, I promise a thoroughly organized district at our next annual state meeting.

RESOLUTION OF SYMPATHY

Dr. R. S. McGeachy, Lenoir County, moved that the Secretary be instructed to send telegrams to Dr. Richard H. Lewis, Raleigh, Dr. I. W. Faison, Charlotte, and Dr. W. S. Rankin, Charlotte, expressing our sympathy in their illness and regret at their absence, and conveying hopes for their recovery. The motion was amended by Dr. J. Howell Way to include Dr. M. L. Stevens, Asheville, and was seconded by Dr. Cyrus Thompson, and carried. (Note: The secretary sent the telegrams as directed.)

REPORT OF STATE BOARD OF MEDICAL EXAMINERS

The President announced that the State Board of Medical Examiners wished to submit its report at this session, and Dr. K. P. B. Bonner, Secretary of the Board, read the following report:

REPORT OF THE BOARD OF MEDICAL EXAMINERS OF THE STATE OF NORTH CAROLINA

K. P. B. Bonner, M.D., Secretary

At certain periods in the life of any administrative body it is always well to indulge in restrospect in order to determine what has been accomplished and to serve as a basis for future activities. This presentation coming at this time is appropriate, in that it may be regarded as an accounting of stewardship at the close of a six years' term. The following is a brief summary of activities:

1. The number of applicants licensed covers only a period of five years. The sixth year will not be rounded out until the conclusion of the annual session beginning next week in Raleigh.

Total number of aplicants licensed	528
By examinations	320
By indorsement	203
By limitation	3
By verification already granted	2

Of this number, thirteen were women, twenty-one were colored, and the remainder were white men.

2. The routine correspondence in the office amounts to about fifteen hundred letters per year. The time consumed with each letter varies from one minute to several hours.

3. The enforcement of medical laws, a duty imposed by law upon the board, has become a most important department. Reported cases of violations are followed up with an investigation, such communication being kept in a special file, and when sufficient evidence has been accumulated the prosecution is begun. No difficulty is experienced in securing a conviction in each case. It is significant that letters are frequently received from the ablest attorneys in the state inquiring relative to our medical laws and requesting interpretations of certain sections.

4. The recent acute shortage in medical service, particularly in rural sections, has made imperative the establishment of a department for the placement of physicians. This service has not only benefited the community but the individual physician seeking a desirable place to work. The assistance of the office is being increasingly utilized; around fifty communities are helped each year.

5. The uniform indorsement application blank, designed and recommended by the Federation of State Medical Boards of the United States, has been adopted. This form is now in use in about thirty states, but North Carolina enjoys the distinction of being the first state to put it in use. A loose leaf system of permanently preserving these applications has been designed and is in use.

6. A card index record of the applicants taking the written examinations has been installed. Under this system the original signature,

as well as individual grades and general average, of each applicant is permanently preserved. It has been possible to complete this only back to 1914.

7. A new form of official register of licentiates has been designed and the names of all licentiates carefully and painstakingly transcribed from the old to the new register, but only after a quadruple check. The size of the new register provides ample space to care for the needs of two hundred years to come. The names have been thoroughly indexed and so arranged as to enable future entries without disturbing the strict alphabetical order. In the transcription, hundreds of names of licentiates were added which the minute-books showed as receiving licenses, but which were omitted from the register. The completion of this work required months of hard detail.

8. A practically complete list of unlicensed registered physicians, who qualified under the provisions of the Act of 1889 on diploma or oath of practice prior to 1885, has been compiled. This was made up from the certified official lists furnished by the clerks of superior court from the hundred counties of the state. The finishing of this official list necessitated the culling of thousands of names (among which were horse doctors, dentists, optometrists, chiropodists, osteopaths, and chiropractors), endless correspondence, and months of arduous toil. When completed the list was bound in permanent form, as further registration of unlicensed physicians was not allowed, which closed the list.

9. Amendments to our medical laws were secured in 1921 wherein the following advantages were gained:

a. Insertion of a clear legal definition of the practice of medicine in the penalty section of the law.

b. The old "fee or reward" clause was dropped from the penalty section, which freed the State of the burden of establishing the receipt of compensation as well as of unlicensed practice.

c. Amendment of the law so that only those holding a license from the State Board of Medical Examiners can be registered by a clerk of superior court.

d. Repeal of the temporary license law.

e. Enactment of specific laws empowering the board to promulgate rules governing applicants.

f. Material strengthening of the laws permitting revocation of license for misconduct, wherein specific causes for action were designated.

g. Legal machinery was created to make possible the holding of inquiries and hearings, with full power of subpoena of the accused and witnesses.

h. Enactment of a law making mandatory the admission as evidence in any court of a certificate under official seal of any matters pertaining to the records.

i. Enactment of a law providing for a transfer of any unexpended balances from one board to its successor.

j. The law requiring a refund of fees paid by rejected applicants was repealed.

10. The repeal of the temporary license law has made necessary two regular annual sessions of the board, which conforms to the custom of practically all other states.

11. We are happy to report that the advances made in our medical laws have been maintained. All proposed legislation in subsequent General Assemblies that would have weakened or destroyed the laws regulating the practice of medicine has been defeated. Notable in such legislation was the effort of the osteopaths to gain the legal right to unlimited practice. There have been hosts of equally dangerous bills but aimed at favoring a smaller group or a single individual. To the members of the medical profession over the state much credit is due for invaluable assistance at various times. The Committee on Public Policy and Legislation of the Medical Society of the State of North Carolina has done splendid work. Many dangerous bills of which few physicians have ever heard have been handled by the board alone and unaided.

12. The North Carolina board enjoys a high prestige nationally, perhaps greater than in all its history. A North Carolina license is now recognized in more states than a National board certificate.

REPORT OF THE BOARD OF MEDICAL EXAMINERS OF THE STATE OF NORTH CAROLINA*

Since the publication of the report of this board in the 1925 TRANSACTIONS of the Medical Society of the State of North Carolina, licenses have been granted to applicants at two sessions of the board, November 25, 1925, and July 20, 1926. The winter session and regular June session were both held in Raleigh. At the winter (1925) session, only applicants for indorsement were considered. The regular annual session required by law was held in Raleigh, June 21-25, 1926, inclusive, and written examinations were given as well as indorsement applications considered.

Including 51 students taking the examinations of the first two years, a total of 187 applicants appeared before the board during the past year. Subtracting the 51 students taking the partial examinations, 136 applicants came up for license, of which number five were rejected and 131 were granted license. Of this number, 93 were licensed after written examination. Of the five rejections, all were rejected on application for indorsement, and for the first time in the history of medical licensure not an applicant failed to pass the written examinations for license. It is a peculiar coincidence that 19 applicants have been granted license by indorsement of credentials at each semi-annual session for the past two years. License for the June session was issued as of July 20, 1926, the date on which the final outcome of the examinations was determined.

Dr. William Preston Holt, Jr., Erwin, made the highest general average on the written examinations, it being 95 3/7 per cent. Drs. Fountain Williams Carroll, Winterville, and Charles Patterson Eldridge, Raleigh, tied for second honors with a general average of 95 per cent.

*Supplementary report filed after the annual meeting for publication in the Transactions.

LICENSED BY INDORSEMENT, NOVEMBER 25, 1925

Name	Address	College and Year		Certified by
Allen, Jacob S. (C)	Chester, S. C.	Leonard	1902	S. C.
Black, Hugh Snoddy	Spartanburg, S. C.	Jefferson	1917	S. C.
Black, Samuel Orr	Spartanburg, S. C.	Jefferson	1915	S. C.
Blair, Andrew	Cleveland, Ohio	Univ. Penn	1924	Nat. Bd.
Braswell, William Edgar	Logansville, Ga.	Univ. Ga.	1907	Ga.
DeShazo, James Beverly	Ridgeway, Va.	Bellevue	1892	Va.
Frink, Horace Westlake	New York City	Cornell Univ.	1905	N. Y.
Gibb, William Blake	New York City	Univ. Toronto	1908	N. Y.
Higgins, Leight Monroe	Athens, Ohio	Johns Hopkins	1920	Md.
Hutton, Daniel Cogdell	El Paso, Texas	Univ. Md	1916	U. S. A.
Lowry, Sidney Allen	Luxora, Ark.	Memphis Hosp.	1900	Ark.
Mahoney, Vernon Litsinger	Oteen	P. & S. Balt.	1915	W. Va.
Patton, Ambler Baxter	Asheville	N. W. Univ.	1911	Ill.
Simpson, William Elihu	Rock Hill, S. C.	M. Col. S. C.	1915	S. C.
Smith, Alick Thomas	Greensboro	Med. Col. Va.	1908	Va.
Stoddard, James Kent	Dodham, Mass.	Johns Hopkins	1916	Mass.
Terry, George Hiram Blakeslee	Oteen	Jefferson	1895	Penn.
Watkins, John Armstrong	Tampico, Mexico	Tulane Univ.	1910	La.
Weddington, James Lester	Dublin, Ga.	Sou. Med., Atla.	1898	Ga.

LICENSED BY EXAMINATION, JULY 20, 1926

No.	Name	Address	College and Year		Grade
3720	Alexander, James Moffatt	Statesville	Georgetown Uni.	1925	91-5/7
3721	Allen, Walter Otts	Hendersonville	Med. Col. S. C.	1926	89-4/7
3722	Baker, Eugene Manigault, Jr.	Savannah, Ga.	Jefferson	1926	86
3723	Barrett, John Milton	Stantonsburg	Univ. Penn.	1926	90
3724	Bennett, Ernest Claxton	Fayetteville	Med. Col. Va.	1926	92-6/7
3725	Bigler, Victor L.	Pittsburgh, Pa.	Uni. Pittsburgh	1925	90-3/7
3726	Boney, Elwood Rantz	Kinston	Univ. Penn.	1926	91-1/7
3727	Boone, Edward Lawrence	Rich Square	Med. Col. Va.	1926	88-2/7
3728	Bostic, William Chivous, Jr.	Forest City	Univ. Penn.	1926	86-6/7
3729	Bridges, Dwight Thomas	Lattimore	Emory Univ.	1926	85-5/7
3730	Brown, James Richard	Charlotte	Tulane Univ.	1926	88-6/7
3731	Carlyle, John Bethune	Wake Forest	Jefferson	1926	87-2/7
3732	Carroll, Fountain Williams	Winterville	Med. Col. Va.	1925	95
3733	Casstevens, John Claude	Hamptonville		1926	87-2/7
3734	Christian, Thomas Davis, Jr.	Brookline, Mass.	Harvard Univ.	1923	84-1/7
3735	Collings, Ruth Mary (F)	Greensboro	Univ. Penn.	1923	89-5/7
3736	Combs, Joseph John	Columbia	Col. P. & S., N. Y.	1926	88-5/7
3737	Cornelius, Chalmers Edgar	Mooresville	Univ. Penn.	1926	90-1/7
3738	Council, Esmond Ensley	Raleigh	Geo. Wash. Univ.	1926	85-6/7
3739	Crow, Samuel Leslie	Camilla, Ga.	Emory Univ.	1925	88-4/7
3740	Crump, Wiley Claude (C)	Lilesville	Meharry	1926	80-1/7
3741	Culler, Hazel (F)	Kernersville	Wom. Med. Phila.	1924	90-4/7
3742	Curry, Lonnie Anson (C)	Clinton	Meharry	1926	80-1/7
3743	Davis, Philip Bibb	Greensboro	Jefferson	1926	88-4/7
3744	Deaton, Hobart Obil	Spies	Wash. Univ.	1926	92-5/7
3745	Disosway, Lula Marjorie (F)	New Bern	Wom. Med.	1925	89-2/7
3746	Dougherty, Joshua Milburn, Jr.	Nickelsville, Va.	Med. Col. Va.	1925	89-3/7
3747	Drewry, William Humphry	Drewryville, Va.	Med. Col. Va.	1926	88-6/7
3748	Eldridge, Charles Patterson	Raleigh	Univ. Penn.	1926	95
3749	Elliott, Julian Carr	Nelson, Va.	Univ. Md.	1926	86-5/7
3750	Floyd, Henry Terrie	Oteen	Johns Hopkins	1923	84
3751	Fox, Robert Eugene	Mount Airy	Univ. Penn.	1926	89-2/7
3752	Gilreath, Robert Arthur	Hendersonville	Univ. Cinn.	1926	91-4/7
3753	Gorham, Herbert Jenkins	Tarboro	Univ. Md.	1926	87-1/7
3754	Griffin, Harvey Lee	Fairmont	Med. Col. Va.	1926	86
3755	Gurevich, Bernard Jay	Washington, D. C.	Geo. Wash. Univ.	1926	90-1/7
3756	Hackler, Robert Hardin, Jr.	Sparta	Jefferson	1926	91-4/7
3757	Hall, Locksley Samuel	Winston-Salem	Univ. Tenn.	1926	83-5/7
3758	Hamilton, John Homer	Wilmington	Harvard Univ.	1916	85-3/7
3759	Harris, William Thomas	Mount Gilead	Med. Col. Va.	1925	87-4/7
3760	Harrison, Edward Thorne	Littleton	Univ. Virginia	1926	90-2/7
3761	Hege, Raymond Webster	Philadelphia, Pa.	Univ. Cinn.	1926	89-6/7
3762	Holt, William Preston, Jr.	Erwin	Jefferson	1926	95-3/7
3763	Hudson, Willard Peyton	Sparta	Univ. Penn.	1925	91-1/7
3764	Johnson, Joseph Lewis	Apex	Jefferson	1926	88-5/7
3765	Jordan, Anthony Leopold (C)	Gastonia	Howard Univ.	1926	86-3/7
3766	Kelly, Luther Wrentmore	Charlotte	University Va.		92-2/7
3767	Kimberly, David, Jr.	Asheville	Univ. Cinn.	1924	90
3768	Lander, Fred Leonard, Jr. (C)	Chester, S. C.	Meharry	1924	86-1/7
3769	Leake, Everette Maiiette	Rich Square	Univ. Md.	1926	84-4/7
3770	Lee, Mike, Jr.	Kinston	Tulane Univ.	1926	87

No.	Name	Address	College and Year	Grade
3771	Lee, Thomas Leslie	Kinston	Med. Col. Va. 1926	88-4/7
3772	Loftin, William Frank English	Mount Olive	Univ. Md. 1926	88-1/7
3773	McLean, Joseph Altira	Gibsonville	Univ. Penn. 1926	88-5/7
3774	McNeill, James Hubert	Washington, D. C.	Geo. Wash. Univ. 1926	90-4/7
3775	Matheson, Robert Arthur, Jr.	Raeford	Jefferson 1926	89-6/7
3776	Mitchell, Luther Carl	Anderson, S. C.	Emory Univ. 1926	90-2/7
3777	Morton, William Richard	Oxford	Med. Col. Va. 1926	91-3/7
3778	Motley, Fred Elliot	Charlotte	Univ. Mich. 1922	90
3779	Neville, Cecil Howell	Whitakers	Tulane Univ. 1926	89-4/7
3780	Newman, Luther Byron	Cullowhee	Univ. Tenn. 1923	84-2/7
3781	Ogburn, Roger Wendell	Greensboro	Cornell Univ. 1926	92-1/7
3782	Ormond, John William	Bessemer City	Univ. Cinn. 1926	88-2/7
3783	Outlaw, Jackson Kent	Kinston	Syracuse Univ. 1923	82-3/7
3784	Overcash, William Earl	Statesville	Univ. Penn. 1926	91-6/7
3785	Pearson, Hugh Oliver	Wilson	Med. Col. Va. 1926	88-4/7
3786	Perry, Samuel Wilmer	Bunn	Emory Univ. 1926	91
3787	Ramseur, William Lee	King's Mountain	Med. Col. S. C. 1926	89-1/7
3788	Rand, Cecil Holmes	Garner	Univ. Penn. 1926	89-2/7
3789	Rand, Emmett Gladstone	Garner	Univ. Penn. 1926	84-5/7
3790	Rouse, Noah	LaGrange	Geo. Wash. Univ. 1924	91-1/7
3791	Royal, Donnie Martin	Salemburg	Med. Col. Va. 1926	88-3/7
3792	Saunders, John Rudolph	Lewiston	Emory Univ. 1926	88
3793	Saunders, Stanley Stewart	Boston, Mass.	Harvard Univ. 1924	91
3794	Scott, Thomas George	High Point	Univ. Cinn. 1923	91-4/7
3795	Scott, Wilhelmina Smith (F)	Hazelridge, Man.	Univ. Penn. 1923	93-5/7
3796	Seawell, Marion Henry	Richmond, Va.	Med. Col. Va. 1926	90-6/7
3797	Sherrill, Heubert Rankin	Statesville	Univ. Tenn. 1926	82
3798	Smith, Harry Bryant	Fremont	Univ. Penn. 1926	86-5/7
3799	Smith, Thomas Julian	Davidson	Tulane Univ. 1926	85-6/7
3800	Smith, William Grady	Raleigh	Med. Col. Va. 1925	84-5/7
3801	Story, Joseph Reynolds	Marion	Tulane Univ. 1926	88-5/7
3802	Sumner, Howard Leon	Asheville	Jefferson 1926	89-1/7
3803	Taylor, Rives Williams	Oxford	Tulane Univ. 1926	87-4/7
3804	Tilley, John Hill	Lebanon, Tenn.	Vanderbilt Univ. 1925	89-5/7
3805	Watkins, Joseph Conrad, Jr.	Winston-Salem	Jefferson 1926	88-6/7
3806	Weathers, Rupert Ryon	Wendell	Med. Col. Va. 1926	86-3/7
3807	Wicker, Guy Lorraine	Winston-Salem	Univ. Md. 1926	88-5 7
3808	White, Estus	Colerain	Tulane Univ. 1926	83
3809	White, James Ryland	Plymouth	Emory Univ. 1926	88-5/7
3810	Widenhouse, Martin Aubrey	Concord	Univ. Cinn. 1925	89-4/7
3810	Wilson, Ross Bynum	Sugar Grove	Univ. Penn. 1926	92-3/7
3811	Young, John Clingman	Asheville	Univ. Tenn. 1926	84-2/7

LICENSED BY INDORSEMENT, JULY 20, 1926

No.	Name	Address	College and Year	Certfi'd by
3812	Conley, Orva	Elizabeth, W. Va.	Univ. Louisville 1916	W. Va.
3813	Ferneyhough, William Todd	Greensboro	Univ. Md. 1916	Md.
3814	Hahn, Milton	Asheville	Johns Hopkins 1907	D. C.
3815	Halstead, Albert Edward	Chicago, Ill.	N. W. Univ. 1890	Ill.
3816	Johnson, Otis Hackett	Morehead City	Atlanta Med. 1905	Texas
3817	Lynch, William Solomon	Lake City, S. C.	Med. Col. S. C. 1900	S. C.
3818	McKay, John Archibald	Mercer, Pa.	Johns Hopkins 1921	Md.
3819	McLellan, Wilbert Ernest	Trinidad, Colo.	Univ. Toronto 1904	Conn.
3820	McLeod, Walter Guy	Maxton	Baylor Univ. 1921	Texas
3821	Maloney, Frederick Fletcher	Dundee, N Y.	Yale Univ. 1901	N. Y.
3822	Patman, William Louis	Athens, Ga.	Harvard Univ. 1921	N. Y.
3823	Schaffle, Karl	Asheville	Univ. Penn. 1907	Penn.
3824	Sorrell, Lewis Edmond	Asheville	Univ. Ala. 1917	Ala.
3825	Stark, Lucien	Montclair, N. J.	Creighton 1903	Neb.
3826	Synnott, Martin John	Hartington, Nebr.	Columbia Univ. 1894	N. J.
3827	Tillson, William Derrick	Windsor, Va.	Univ. Va. 1919	Va.
3828	Tucker, Thomas Ellis	Tarboro	Univ. Ala. 1920	Ala.
3829	Yates, William Shaftner	Junction City, Kan.	Kan. City Med. 1893	Kan.
3830	Zimmerman, George Franklin	Malone, N. Y.	Univ. Buffalo 1907	N. Y.

EXAMINATION IN ANATOMY AND EMBRYOLOGY—1926

L. A. Crowell, M. D., Lincolnton

1. Describe the embryonic development of the ovary, and explain how a dermoid cyst of the ovary is formed.

2. Trace a drop of blood from the inferior vena cava of the pregnant mother to the right occipital artery of the fetus.

3. Describe the shoulder joint.

4. Give deep origin, foramina of exit, distribution and functions of the fifth cranial nerve.

5. Name the muscles of the abdominal region and give nerve supply.

6. Name the extrinsic and intrinsic muscles of the eye, and give nerve supply of each.

7. Draw a transverse section of the spinal cord in the middorsal region, indicating the principal nerve tracts.

8. Name the structures, in order, that would be divided in a circular amputation of the thigh at its middle third.

9. Name and describe briefly the accessory sinuses of the face.

10. Give the location of the cardiac valves on the anterior chest wall.

EXAMINATION IN HYGIENE, CHEMISTRY, AND PHYSIOLOGY—1926

William M. Jones, M.D., Greensboro

1. Define: Allergy, Anaphylaxis, Prophylaxis, Incubation, Invasion, Endemic, Epidemic, and Pandemic.

2. Name the diseases that should be required by law to be reported.

3. Give indications and contra-indications for the administration of iodin for abnormal functioning of thyroid.

4. What are the normal limits of blood sugar? Give a test for same.

5. What are vitamins? Name them. Where found, and in what condition indicated?

6. How would you positively determine a case of hemophilia?

7. What are the functions of blood?

8. Give action and characteristics of pancreatic juice.

9. Name the cranial nerves and give functions.

10. Describe briefly the endocrine organs.

EXAMINATION IN HISTOLOGY, PATHOLOGY, BACTERIOLOGY—1926

C. A. Shore, M.D., Raleigh

1. Given a patient with typhoid fever: (a) In what portions of the body are typhoid bacilli ordinarily found during the first ten days of the illness; (b) during the third and fourth weeks; (c) after convalescence? (d) When a patient becomes a carrier, in what parts of the body do the typhoid bacilli usually establish their foci, and how are they excreted?

2. If you were called to see a patient who had been bitten by a dog which was apparently in a normal condition, what precautionary steps would you take in reference to the dog? If the dog should show suggestive symptoms of rabies within a week after the patient had been bitten, what steps would you take to establish a diagnosis? What treatment would you give the patient at first consultation?

3. Given a patient with a genital sore that had existed for not more than one week: Describe briefly the laboratory methods you would employ to determine whether or not it is a primary syphilitic lesion. Would you employ a complement-fixation test, and if so from what part of the patient's body would you secure the material for the test?

4. Given a patient with an ulcerated tonsil, what laboratory methods would you employ to establish a diagnosis? Briefly describe the microscopic appearance in each case should you find that the ulcer was caused by (a) diphtheria; (b) Vincent's angina; (c) syphilis.

5. Describe the ova, as seen under the microscope, of the round-worm (Ascaris lumbricoides), dwarf tapeworm (Hymenolepsis nana), and hookworm (Necator americanus).

6. Name and describe three bacteria which may cause meningitis.

7. Name and describe three bacteria which may cause conjunctivitis.

8. Describe the resolution of an inflammatory exudate.

9. What is the difference between active and passive immunity? Give two examples of each as applied in the prevention of disease.

10. What diseases are supposed to be associated with disturbances of (a) pituitary gland; (b) thyroid gland; (c) pancreas; (d) suprarenal?

EXAMINATION ON PRACTICE OF MEDICINE—1926

Wm. P. Holt, M.D., Erwin

1. Discuss diabetes mellitus. Give dietetic and insulin treatment.

2. Differentiate acute psoriasis, pityriasis, tinea circinata. Give briefly treatment of each.

3. Differentiate hydrocele from scrotal hernia; recommend treatment.

4. Give a brief outline of a general history of a case. Outline briefly a general examination, giving a routine laboratory examination.

5. Name some indications for lumbar puncture. Describe technic of lumbar puncture and paracentesis thoracis.

6. Define: (a) Muscae volitantes, (2) halitosis, (3) illusion, (d) delusion, (e) hallucination, (f) aphasia.

7. Give diagnosis of acute nephritis, and name some conditions with which it is often confused.

8. Describe normal heart sounds, and give symptoms of myocarditis.

9. Give the indications for blood transfusion, and name the dangers that may arise from the use thereof.

10. Give the diagnosis of achylia gastrica and hyperacidity. Treat each, and give symptoms of acidosis and alkalosis.

EXAMINATION IN MATERIA MEDICA, PHARMACOLOGY, AND THERAPEUTICS—1926

J. G. Murphy, M.D., Wilmington

1. Name the principal medicinal preparations of sodium and briefly state their physiological action.

2. Name a vasomotor stimulant and a vasomotor depressant and describe the physiological action of each.

3. Name several drugs that render the urine alkaline and describe their indications.

4. How would you treat a case of uremia?

5. What are the pathological conditions for the relief of which diuretics are administered?

6. Write a prescription for the following: (a) ozena; (b) cystitis; (c) tic douloureux; (d) delirium tremens; (e) acute otitis media.

7. Give treatment for anhydremia.

8. Treat a case of erysipelas.

9. Describe the toxic effect of atropin and outline the treatment of same.

10. Give treatment for the toxic effect of cocain.

EXAMINATION IN GYNECOLOGY, OBSTETRICS, PEDIATRICS—1926

K. P. B. Bonner, M.D.., Morehead City

1. Describe the etiology, symptoms, and operative treatment of cystocele.

2. Give the differential diagnosis of cancer of the uterus and fibroid polypus in the cavity of the uterus.

3. Define: (a) Ectopic gestation; (b) Endocervicitis; (c) Granular vaginitis; (d) Hydrosalpinx; (e) Imperforate hymen; (f) Intertrigo vulvae; (g) Kraurosis vulvae, (h) Lithopedion.

4. Name four danger signs of late pregnancy and outline effective treatments for their relief.

5. Detail delivery of a face presentation wherein the position is to the right and posterior.

6. Define: (a) Anencephalus, (b) Carneous mole, (c) Chloasma, (d) Hydrorrhea gravidarum, (e) Nägele's obliquity, (f) Obtecta pelvis, (g) Oligoamnios, (h) Pubiotomy.

7. Give differential diagnosis of urticaria, measles, and scarlet fever.

8. Describe the symptoms, prognosis, and treatment of acute bronchopneumonia in a two-year-old baby.

9. Define: (a) Acute inanition; (b) Atelectasis; (c) Erb's paralysis; (d) Geographic tongue; (e) Glandular fever; (f) Intussusception; (g) Noma; (h) Status lymphaticus.

10. (a) Outline a practical method of routine medical supervision of a well baby from the sixth month to the end of the first year.

(b) Name the common accidents to the mother and baby during delivery.

(c) Discuss the treatment of leukorrhea, and the use of the pessary.

EXAMINATION IN SURGERY—1926

L. N. Glenn, M. D.. Gastonia

1. Give diagnosis and treatment of a bone cyst.

2. Differentiate tubular lymphangitis from reticular lymphangitis and treat each.

3. Differentiate between traumatic and infectious arthritis.

4. Give general management of a postoperative "pus belly."

5. Diagnose a tuberculous kidney, and remove it.

6. Give surgical significance of free fluid in abdomen, and treat one causative condition.

7. Note essentials of a hollow viscus anastomosis, and do one.

8. Treat compound fracture two inches above elbow.

9. Diagnose and remove an active exophthalmic goiter.

10. Discuss tenosynovitis.

NOMINATING COMMITTEE

The delegates from each district met and selected the following members to serve as the Nominating Committee:

First District	
Second District	Dr. L. B. Evans
Third District	Dr. John D. Robinson
Fourth District	Dr. C. P. Parker
Fifth District	Dr. J. F. Nash
Sixth District	Dr. R. L. Felts
Seventh District	Dr. H. L. Sloan
Eighth District	Dr. C. S. Lawrence
Ninth District	Dr. A. A. Kent
Tenth District	Dr. C. V. Reynolds

There being no further business, the House of Delegates adjourned at 11:10 P. M.

WEDNESDAY, JUNE 16.

The House of Delegates re-convened at 8 P. M., in the convention room of the Oceanic Hotel, and was called to order by the President.

REPORT OF COMMITTEE ON FINANCE

Dr. John B. Wright, Chairman, submitted the following report, which was approved:

Wrightsville, N. C., June 16, 1926.

Your committee appointed to audit the financial report of the secretary-treasurer for the year ending June, 1926, beg to report that they have examined the report and find it correct and in balance.

The committee takes this occasion to congratulate Dr. L. B. McBrayer for his painstaking and efficient services rendered this society.

(Signed) Jno. B. Wright, *Chairman.*

REPORT OF COMMITTEE ON THE PRESIDENT'S ADDRESS

The following report was read and accepted.

The address of the president was so far-reaching in its scope, embodying so many vital issues, that your committee feels a hesitancy in attempting in so short a time to render a report, there being so many suggestions and recommendations demanding the most careful thought and consideration. However, it is thought that in each of the measures dealt with committees should be appointed to give careful study throughout the year and to report at the next annual meeting.

Since legislation is now pending in the matter of the Harrison Narcotic Act, it is suggested that the committee handling this problem be given the right to act for the Society before the next annual meeting, in the event that such a necessity arises.

The committee is in entire accord with the president's expressed opinion that the TRANSACTIONS should not be abolished. There is still the question to be decided whether or not the society should have an official journal other than the TRANSACTIONS.

The committee feels that a single committee to consider the three problems: a whole-time secretary, a whole-time secretary of the board of examiners, and the publication of a journal, would be more expedient because of the overlapping nature of these several suggestions.

The question of the centralization of the several State institutions for the care of the tuberculous, the feeble-minded, the orthopedic, and possibly others, is deemed worthy of the fullest consideration.

The committee further recommends that some plan be adopted by the secretary whereby this excellent address may be placed speedily in the hands of every practitioner in North Carolina; or, if not inconsistent with the president's wishes, it be given to the press of the state.

It is recommended that the retiring president appoint these several committees.

(Signed) R. L. FELTS,
FOY ROBERSON,
EDWARD J. WOOD.

REPORT OF THE COMMITTEE ON NOMINATIONS

Wrightsville Beach,
June 15, 1926; 6 P. M.

Mr. President, and Gentlemen of the Medical Society of the State of North Carolina:

Your Nominating Committee met with the entire membership present and unanimously nominated the following named gentlemen for office as indicated:

For President—DR. JOHN Q. MYERS ..... Charlotte
For First Vice-President—DR. J. W. CARROLL ..... Wallace
For Second Vice-President—DR. A. Y. LINVILLE ..... Winston-Salem
For Third Vice-President—DR. C. H. COCKE ..... Asheville

Committee on Public Policy and Legislation

DR. JOHN B. WRIGHT, *Chairman;* DR. A. A. KENT, DR. K. P. B. BONNER.

Committee on Finance

DR. C. W. MCPHERSON, DR. E. A. LOCKETT, DR. R. S. BEAM.

Committee on Obituaries

DR. E. G. MOORE, DR. H. A. ROYSTER, DR. C. M. VAN POOLE.

Committee on Publication

DR. L. B. MCBRAYER, *Chairman ex-officio;* DR. J. M. NORTHINGTON, DR. R. P. NOBLE.

Delegates to American Medical Association

The appointment of DR. W. D. JAMES, of Hamlet, and DR. M. L. STEVENS, Asheville, by the Council, for 1926 and 1927, was approved. DR. J. G. MURPHY, Wilmington, was elected to succeed Dr. W. S. Rankin for 1927 and 1928.

Alternates: DR. A. J. CROWELL, DR. G. H. MACON, DR. E. S. BOISE.

Delegates to Medical Society of Virginia

Dr. D. T. Tayloe, Jr., Dr. C. A. Woodard, Dr. J. W. Long, Dr. W. J. Hunnicutt.

Delegates to South Carolina Medical Association

Dr. Charles Allen, Dr. J. F. Abel, Dr. E. L. Bowman, Dr. W. E. Warren.

Place and Time of Next Convention

Durham, Asheville, and Pinehurst extended invitations for the next meeting. Durham was unanimously selected. We ask the secretary to write to the Buncombe County Medical Society and to Mr. Leonard Tufts, of Pinehurst, and express our appreciation for their cordial invitation to meet with them.

Time of the next convention: Third Tuesday in April, 1927.

Chairman of Committee on Arrangements: Dr. W. M. Coppridge, Durham.

Respectfully submitted,

A. A. Kent, *Chairman,*
John D. Robinson, *Secretary.*

The report of the Nominating Committee was adopted, and the House of Delegates then adjourned *sine die.*

REPORT OF COUNCIL*

The Council met in the Oceanic Hotel on June 15, 1926, with the following members present:

First District, H. D. Walker, Elizabeth City; Second District, G. G. Dixon, Ayden; Third District, E. J. Wood, Wilmington; Fifth District, J. D. Highsmith, Fayetteville; Sixth District, V. M. Hicks, Raleigh; Seventh District, T. C. Bost, Charlotte; Eighth District, F. R. Taylor, High Point; Tenth District, W. J. Hunnicutt, Asheville.

Dr. V. M. Hicks was elected president, and Dr. W. J. Hunnicutt was elected secretary and treasurer. The Board of Councilors indorsed and ratified the action of the president and secretary of the State Medical Society in calling a meeting of the Board of Councilors in February, 1926, for the purpose of electing two delegates to the American Medical Association and attending to other matters.

There being no other business to come before the meeting, the Council adjourned.

(Signed) W. J. Hunnicutt, *Secretary.*

*Report filed for publication in The Transactions.

SCIENTIFIC PAPERS

SECTION ON SURGERY.

SECTION ON PRACTICE OF MEDICINE.

SECTION OF MEDICAL VETERANS OF THE WORLD WAR AND MEDICAL OFFICERS' RESERVE CORPS.

SECTION ON PUBLIC HEALTH AND EDUCATION.

SECTION ON PEDIATRICS.

SECTION ON EYE, EAR, NOSE, AND THROAT.

SECTION ON CHEMISTRY, MATERIA MEDICA, AND THERAPEUTICS.

SECTION ON GYNECOLOGY AND OBSTETRICS.

SECTION ON SURGERY

Chairman: Foy Roberson, M.D., F.A.C.S., Durham.

PROGRESS IN THORACIC SURGERY

George L. Carrington, M.D., Durham.

Among the early records of the race are some of anesthetics and surgical operations. In the second chapter of Genesis it is told that a deep sleep was caused to fall upon Adam while one of his ribs was being resected. We learn that Helen of Troy was familiar with anesthetics and cast nepenthe into the wine of Ulysses. From prehistoric neolithic times saws and knives have been found that appear to have been used for trephining, and on the doorpost of a burial ground near Memphis, Egypt, are pictures of surgical operations recorded in the twenty-fifth century before the birth of Christ. The procedures remained primitive, however, and the results achieved were not such as to encourage either operators or patients until Pasteur and Lister laid the foundations for the development of successful elective surgery. With the introduction of asepsis and the development of general anesthetics by Long, Warren, Morton, and Bigelow the field rapidly broadened, technic developed, results were compared and procedures standardized. With the broadening field and increasing knowledge specialization came into being and grew as specialized knowledge increased. Men devoted themselves to the surgery of the extremities, of the perineum, the abdomen, the nose, throat, ear, eye, brain, the urinary tract, and central nervous system. And finally thoracic surgery has come, as Willy Meyer said, "The youngest and last child among the surgical specialties."

That this should be the child of surgery's old age is due primarily to the fact that elective surgery of the thorax is accompanied by the greatest difficulties; for the thorax, besides containing the great vessels and important nerves, is the seat of two of the three vital organs that constitute the tripod of life (Hedblom). In the last two decades much work has been done and considerable progress made. The introduction by Sauerbruch of differential pressure gave an impetus to investigations, and the later use of intratracheal insufflation by positive pressure simplified the way of the investigator. Soon the World War gave its added impetus. The frequency with which soldiers withstood severe chest wounds and open pneumothorax gave rise to the feeling in many quarters that the chest could be explored as safely as the abdomen. Many who acted upon this feeling were disappointed. The reason is no doubt partly to be found in another lesson that the war brought home, which was that soldiers with a streptococcic empyema died when a small opening was made in the chest wall, even though those in the field might stand well wounds that opened the chest widely. Certainly an important factor here was the difference in vital capacity. The first patient, in addition to being toxic, had a small vital capacity; the second patient, in addition to being physically fit, had a large vital capacity.

Despite the fact that we are still far from the goal and have many discouraging failures behind us and difficulties ahead of us, an inquiry into the present status of thoracic surgery shows definite progress. During the last two decades there have been developed regional and differential pressure anesthesia, pneumothorax, extrapleural collapse and phrenicotomy in unilateral tuberculosis, endoscopy (bronchoscopy and esophagoscopy), lobectomy, extrapleural collapse for pulmonary suppuration, mediastinostomy, pericardiostomy, and valvotomy; and closed drainage of empyema thoracis has been revived, with the addition of irrigation with Dakin's solution of chlorinated lime.

Empyema—Empyema remains the condition that most frequently calls for interference by the surgeon. In its treatment it is necessary to distinguish between streptococcic, other pyogenic, and tuberculous infections. The experiences of 1918 demonstrated the fatal error of open operation in streptococcic infection until after the fluid has become thick and adhesions have formed. In all types of empyema with thick fluid there is considerable latitude in the selection of method of treatment. Many surgeons have a preference for one type of operation that they use in practically all cases. Others vary their procedure, in the belief that for a particular individual a selected method offers greater chance for success. Closed drainage with regular Dakin's solution irrigation still produces the good results that were evident from the first, but its use is seemingly less widespread than was the case at the end of the war. There have been good results from the use of continuous suction in the closed method, maintaining a constant negative pressure to keep the lung expanded. The apparatus is not available in most hospitals, so its use has been limited. Intercostal drainage and rib resection still have about the same division of followers as formerly. With either procedure Dakin's, acriflavin, and other solutions are used for irrigation. Bacterial counts for closure, though sometimes misleading, are still found useful. The blowing of soap bubbles and Wolfe bottles maintain their usefulness in later treatment for expanding the lung.

Chronic Pulmonary Suppuration—In the treatment of chronic pulmonary suppuration there are many problems involved and a variety of procedures employed. It is a hopeful sign, however, that more careful differentiation is being made between the types of suppuration: bronchiectasis, central or peripheral abscess, and interlobar collections. The treatment varies with the type of lesion and the surgeon. In early pulmonary abscess that does not show a tendency to become worse, expectant treatment with postural drainage not infrequently is all that may be needed. Chevalier Jackson has reported considerable success with bronchoscopic lavage and drainage in cases of suitably located suppuration. Pneumothorax, collapse, drainage, lobectomy, and cautery extirpation are all recommended. In chronic multilocular bronchiectatic abscess, extirpation with partial cautery excision seems rational. Unfortunately, the involvement is often bilateral. In acute centrally located abscess, pneumothorax collapse associated when possible with bronchoscopic lavage seems the rational treatment. It is difficult to drain a centrally located abscess through the chest wall; considerable damage

may be done to the lung tissue in the process of drainage; and with no adhesions having formed between the two pleural surfaces the resultant pneumothorax is dangerous. In the peripherally located abscess, however, access is easy; and since adhesions have usually formed between the two surfaces, collapse would be difficult to obtain as a treatment and is fairly remote as a danger in connection with drainage. In chronic bronchiectatic and abscess suppuration, graded extrapleural thoracoplasty has been found to have a low mortality and to be attended with good results. It will no doubt have a larger and larger field of employment. In chronic empyema, irrigation with Dakin's solution (chlorinated soda), accompanied by chest wall collapse and obliteration of the cavity, has been a definite advance in the treatment of these conditions. The Dakin's reduces the size of the cavity; then the surgeon obliterates the cavity by collapse of the chest wall. If bronchial fistulas remain they can usually be closed, in a fairly clean field, by silver nitrate or by plastic procedures.

Prophylaxis deserves place in the consideration of pulmonary suppuration. Despite the undoubted occurrence of embolic abscess, the vigilant effort to prevent aspiration pneumonia and abscess will continue unabated. The early removal of foreign bodies from the bronchi has also been of great prophylactic value. It has prevented the occurrence of many pulmonary abscesses and has cured others before they have become chronic.

Neoplasms—Neoplasms in the chest are varied. Chondromata are the most frequent. They recur, metastasize, and kill. Lipomas, dermoids, sarcomas, Hodgkin's, lymphosarcomas, and carcinomas occur. There have apparently been some cures of sarcomas and carcinomas by extirpation. Radium and x-ray have been of use in delaying Hodgkin's and lymphosarcomas. Most neoplasms in the chest, however, have been diagnosed too late for surgery to have much chance for their radical cure.

Pericardium and Heart—Pericardial disease is being watched for more carefully. Aspiration of the pericardium is relatively simple, and its more frequent employment will lead to fewer diagnoses being delayed until necropsy. Open drainage of the pericardium has been discouraging, but it is hoped that wider employment of closed drainage will result in statistics that will be more encouraging. Cardiolysis for adhesive pericarditis is rational and will probably be employed more frequently in the disease before the heart has been too much damaged for any operation to be of much benefit.

In angina pectoris encouraging reports are coming in from the employment of cervical sympathectomy and the extirpation of the cervical ganglia. The nerve effects are somewhat more extensive than was at first thought, but relief in some cases of angina pectoris has been distinct.

The most remarkable work in the field of cardiac surgery has been done by Cutler and his associates. After careful animal experimentation, five cases of mitral stenosis were operated in the human. Valvotomy was performed in each. One patient recovered and was much improved for two years later. The other four died; two on the day of

operation, one three days later and the other seven days later. It must be noted, however, that none of the patients operated upon had had any hope held out medically.

Mediastinitis—Until a few years ago suppurative mediastinitis was considered uniformly fatal. Within the past few years, however, it has been operated successfully. One surgeon reports four successful operations out of five and another three out of three.

Esophagus—Esophageal surgery has been the golden fleece that has lured men to their greatest and most determined efforts to conquer the difficulties that the thorax offers against the exploration of the surgeon. The list of those who have spent their efforts of years towards the solving of its problems is a distinguished one. The fleece has not yet been grasped; but occasionally in the distance we may catch its gleam, still guarded by dragon difficulties but holding forth rich promise to him who may successfully carry through. Certain things have been accomplished. Cardiospasm has been found often to yield to hydrostatic dilation. Cicatricial strictures have not infrequently been successfully treated by means of the silk thread and bougie. In fact, apparently hopeless strictures, with esophago-bronchial fistulas, have been cured following dilatation of the stricture. Pulsion and traction diverticula are operated with rather constant success. Foreign bodies are extracted with extraordinary facility by the skillful bronchoscopists.

The cure of carcinoma of the esophagus has been the goal towards which the surgeon and experimental surgeon have directed the most persistent efforts. Many dogs have offered up their lives that men afflicted with this disease may live. Anastomoses thought at one time to be impossible are now done. Experimentally the level of the diaphragm is raised to bring part of the esophagus into the abdomen; also the stomach is mobilized and drawn above the diaphragm into the chest. In the one case the lower esophagus is converted into an abdominal organ, and in the other the stomach is changed into a thoracic viscus. Extrapleural, mediastinal, and transpleural resections of portions of the esophagus are done. Stomach, intestine, skin, fascia, and granulation tubes are made to replace portions of the esophagus. The esophagus is brought entirely without the thorax. Numerous methods of anastomosis between cut ends of the viscus and between the esophagus and stomach are performed, some with but more without the Murphy button. Several successful resections of the cardiac portion of the esophogus have been performed for carcinoma at the junction of the stomach and esophagus. But until March, 1913, there had been no successful operation for cancer of the thoracic esophagus. In that year Thoreck performed his successful operation upon a woman who lived for twelve years thereafter without recurrence and then died of pneumonia at the age of 79 years. Recently (March, 1924), Eggers operated upon another patient by the same method with success. In the intervening eleven years there were operations of partial success such as Lilienthal's, whose patient lived for two years before dying of a recurrence. All this means that carcinoma of the esophagus, while still a dread antagonist, can not longer

claim a toll of one hundred per cent. Death has twice been cheated of his victim, and his opponents are on guard, alert, with loins girded. Hope sees a star, and working surgeons can hear the whisper of a promise.

Tuberculosis—A recent important advance in therapy has been the bringing of a group of cases of pulmonary tuberculosis into the realm of surgical treatment. This treatment is not intended to replace medical treatment of phthisis. It is to supplement medical treatment and, in a certain small percentage of selected cases, to be applied after medical treatment has failed. Incipient tuberculosis is entirely a medical condition, and by proper regime carefully carried out has practical assurance of one hundred per cent of cures or stoppage of activity. There are, however, a certain number of patients who have not been put under this regime early enough but have gone on so far that the usual treatment of rest, fresh air, and forced nourishment are not sufficient. If adhesions have not formed the lung can be put at rest by the production of an artificial pneumothorax. This procedure has been one of the happiest in modern therapy. But there remain a few patients in whose chests adhesions have formed that prevent the production of a pneumothorax by the introduction of air or nitrogen. It is in certain ones of this type that extrapleural collapse has its place. The appropriateness of the procedure depends largely upon the extent and position of the disease, together with the fact of its chronicity and failure to heal after the usual regime. The key to the correct selection of patients for operation consists in the establishing of the fact of a predominantly unilateral tuberculosis together with a correct estimation of the patient's resistance—his ability to stand the operation. If he is in a condition to stand the operation and has a tuberculosis the principal activity of which is on one side, with a fairly good lung on the opposite side, then the chances of success are good. The procedure varies with different individuals. Some surgeons do a preliminary phrenicotomy on the affected side as the test of the patient's resistance. Some, in a two-stage operation, resect the upper ribs first; others prefer to resect the lower ones first. Since the principal site of the disease is usually in the upper lobe, the procedure of first compressing it is probably more rational. This procedure also leaves the lower lobe expanded with the cough reflex working more efficiently—a fact that no doubt decreases the postoperative pneumonia from secretions above draining into the area below. The amount of each rib removed varies. The dorsal portion is removed subperiosteally and extrapleurally. If the lung is stiff, 16-18 cm. of each rib may be removed, but if the lung and chest wall sink in much during operation it is better to remove much shorter lengths.

Statistics are quite encouraging. Alexander collected 1024 cases operated in the years 1918-1922. There were apparently cured 32 per cent; improved 26 per cent; worse, no change, or result unknown 11 per cent; deaths within six weeks of operation 12 per cent; deaths not from operation but usually from tuberculosis in other lung 19 per cent. When it is considered that this procedure of paravertebral extrapleural collapse is to be used only where the usual regime of rest and feeding have failed to stop the advance of the disease, it becomes an important addition to our methods of treatment.

The Future—Though some is known, much remains to be learned. There is need for more knowledge of pathology and diagnosis, more information about the types and workings of infecting organisms; and there is a virtually untouched field of immunity, chemotherapy, and serotherapy to be investigated, plowed, planted, cultivated, and harvested. Another outstanding need is that of a uniform method of producing pleural adhesions.

There has been much work done; there is more work to do. We can look forward to improvement in the field of thoracic surgery, perhaps not rapidly, but surely. How far, we cannot say, but we can look forward with some confidence and a large amount of hope..

DISCUSSION

Dr. A. G. Brenizer, Charlotte: I am rising merely to thank Dr. Carrington for the privilege we have had in having thoracic surgery reviewed before us and for his calling our attention to the possibilities of thoracic surgery. Before the war I felt that everything in thoracic surgery had to be sent to Willy Meyer to be put in his negative pressure cage. I knew nothing about thoracic surgery but did go in the chest wall to remove foreign bodies, putting in salt solution packs and sometimes causing an empyema. It is surprising how well this salt solution pack did. I had one case of a woman with an abscess in the upper portion of her lung. I merely resected a couple of ribs, caught the lung up to the parietal pleura, and injected some iodin with a needle. After it was adhered, in about five days, I opened it and found some necrotic lung in the abcess cavity. Finally it healed up. Thoracic surgery, in a case like that, certainly gives a great deal of satisfaction; and so far it is not very difficult, and the principle is simple. As to resection of the esophagus, etc., I do not know that I should attempt to do anything like that, but in these other cases it is very gratifying to see them come up from an anemic, rundown condition and blossom out again.

Dr. E. A. Lockett, Winston-Salem: I should like to report a case we had in camp, in which there was a very definite abscess on the right side, which was drained, and empyema on the left side, which was drained. Fortunately, after a long convalescence, during which considerable necrotic lung came out with the abscess, the man recovered and returned to duty.

Dr. Carrington (closing the discussion): The point I wanted to bring out is that we are inclined to confine ourselves too much to opening abscesses and draining empyema. Other things have to be done in the chest and can be done, and I think we ought to be on our toes and do them.

VENTRICULOGRAPHY AND VENTRICULAR ESTIMATION

(Lantern Slides)*

Addison G. Brenizer, M.D., F.A.C.S., Charlotte.

This is a method of showing the position and size of the ventricles by the injection of air into the ventricles of the brain, reading on the x-ray plate, through the contrast you bring about by the injection of the air,

*Note: Illustrations for this paper could not be secured.

the position, capacity, and formation of the ventricles. I think a knowledge of intracranial pressure is probably the most important thing in handling any encroachment upon this closed box. You are all aware that the falx cerebri and the tentorium cerebelli divide the cranial cavity into three chambers.

(Next Slide) You are also aware of the relative position of the lateral ventricle, with its three horns and its three portions superimposed upon certain surface convolutions.

(Next Slide) You are also aware of the spaces in the brain occupied by the cerebrospinal fluid. The foramen of Munro connects the lateral ventricles. The fluid makes its way from the third ventricle, through the aqueduct of Sylvius, into the fourth ventricle. Then there are three foramina. This fluid has a definite circulation. It is formed and secreted in the lateral ventricles and finally reaches the surface of the brain and is taken up by little villi of arachnoid piercing the sinuses. A certain amount of that fluid makes its escape along the cerebral nerves and is absorbed by the lymphatics. The pressure of fluid is equal everywhere.

(Next Slide) In the ventricles here, at the basal cisterna, and by spinal puncture the pressure is shown to be equal at all these points. You are also familiar with the fact that if the brain swells or has obstruction along the fluid pathway it will block these little villi and the pressure will rise. If that pressure reaches a certain height something will happen. If you get a medullary compression there will be a rise in temperature and slow heart beat, and you go from there into Cheyne-Stokes respiration and collapse, with rapid respiration, rise of temperature, etc. I think decompression is often not very useful, because the hole is blocked almost immediately by the protrusion of the brain.

(Next Slide) If any portion of the brain is encroached upon the ventricle will usually show it. There is a compensation taking place within the accumulation of fluid in the ventricle, whether it be pressed upon or removed.

(Next Slide) This is a diagram to show relatively both reduction of ventricle by pressure and enlargement by compression.

(Next Slide) The incisions are occipital. You have a little funnel trephine to guide the needle in, with syringe and hose and needle attached, so as not to let air in. The ventricle is punctured.

(Next) With the needle inserted in this way, into the higher portion of the ventricle, fluid is removed and air inserted. You can bring out a contrast shadow. With the side up, right or left, the air rises to the top.

(Next) In this case unintentionally these conditions were brought about by me. This child had hemophilia, and I did a transfusion into the lateral sinus. From the weight of needle and hose there was a puncture of the lateral sinus. The child immediately went into convulsions and became unconsious. Over a period of several weeks repeated spinal punctures were done, until finally the child returned to normal.

The next is a case of hydrocephalus. The only excuse at all for doing this would be to determine the point of obstruction. In so-called idio-

pathic hydrocephalus the obstruction is due to failure of the villi. Probably sixty per cent of cases of hydrocephalus are due to blockage in the aqueduct of Sylvius.

(Next) You see this enormous dilated ventricle occupying most of the space in the cerebral hemispheres, with both horns extending way below there. This is the other ventricle here, enormously dilated. If this were a better picture you would see little streaks of air over the convolutions, showing that the air had reached the cortex. This is a case of so-called idiopathic hydrocephalus, and offers no cure. Were the obstruction in the aqueduct of Sylvius, it could be cured.

(Next) This is a case of a normal ventricle. You will see the outline of the ventricles here (indicating).

(Next) The other side showed quite a contrast to that. The horn of the ventricle has been flattened out, the other part of the ventricle being pushed backward, and is sunken, making this impress upon the air in the ventricle as well as deforming this ventricle. The abscess is outlined.

The next picture is taken forward here, this being the right side, which showed this deformed ventricle. Here is the lateral ventricle, the third ventricle; the other lateral ventricle; the whole works pushed over to the opposite side. This being the left side, anything that would deform the ventricle must be on the right side. You get some idea of the size of the thing from that deformity. In this case the abscess was punctured and the pus aspirated, and only a very small filament left down into the hole. After repeated aspirations the case recovered. The man had been unconscious for several days. The operation was done under local anesthesia, and while on the table he regained consciousness.

This is a case drawn from Dandy, showing what happens to the ventricles with the presence of an abscess. The ventricle forward is pretty well obliterated. As you go backward it is somewhat compressed also.

(Next) This is practically a normal ventricle outlined there with air. This was a case of Dr. Barron's with a suspected tumor of the brain, but not localized.

(Next) In this ventricle again you see part of the ventricle entirely obliterated.

(Next) Here you see again the ventricles pushed over almost entirely to the opposite side. This man died, and no autopsy was done, but I think it is certain that he had a tumor in his frontal lobe producing that deformity.

The story is simply this: Through an ordinary neurological examination about fifty per cent of tumors would certainly be suspected from the general symptoms of increased intracranial pressure, such as headache, choked disk, increase in blood pressure, increased spinal fluid pressure. Having gone that far, fifty per cent of tumors, including all growths, would be diagnosed by ordinary neurological methods, and localized by ordinary neurological methods. About fifteen per cent would be localized by x-ray pictures. The remainder, about thirty-five per cent, can not

be localized in any other way except by outlining the ventricles, showing their position, their size, and any deformity of the ventricles. Therefore the usefulness of this so-called ventriculography or pneumography. All tumors, I think, can be localized with air.

What I mean by ventricular estimation is this: In a case where the pressure is rather high, and you would be afraid to change pressure conditions by withdrawing fluid and injecting air, you can get a fair estimate by withdrawing the fluid and injecting some coloring matter. Your judgment in that case would be fairly accurate; not as accurate, however, as air. There is no doubt that ventriculography will be an enormous aid.

DISCUSSION

Dr. C. S. Lawrence, Winston-Salem: We used to feel that an encroachment on the brain was a very delicate and hazardous proposition, and we kept out of the skull. I think the lessons we learned during the war in handling brain cases were good for all of us. We learned that the brain could be handled pretty roughly, and get by with it. I do not mean that a novice should go into the skull, but one should use ordinary knowledge and skill in diagnosing pathology of the brain. I think the use of ventriculography in diagnosing neoplasms of the brain is a great step forward.

APPENDICITIS—THE CRESCENDO OF TREATMENT

John Wesley Long, M.D., F.A.C.S., Greensboro

It seems that we shall forever have to deal with appendicitis, since, like the poor, it will always be with us. However, the improvement in the operative technic, the newer methods of dealing with certain of the sequelae, and the steadily decreasing mortality are gratifying evidences of progress in the treatment of this protean disease. Nor should we forget to mention that the greater skill and the wisdom of experience which naturally come to those who handle large numbers of these cases are factors that are not to be despised in the treatment of so grave a malady as that under consideration. We may never reach the heights of perfection in the treatment of appendicitis, but the profession is steadily climbing till once in a while we get a glimpse of the promised land.

Primarily a vast majority of cases of appendicitis are in the hands of the general practitioner. The surgeon is not disposed to complain of the dilatory tactics of the practitioner, but it is manifest that there still lingers in the minds of some of our brethren the conviction that a brisk purgative will save many a case of appendicitis from the surgeon's knife. And this attitude is not confined to the doctors who live at the crossroads and the remote rural districts, for we frequently meet with instances of this kind among practitioners of our towns and larger cities whereas those physicians who are out on the firing line often act more promptly.

I grant you that a purgative will relieve many cases of appendicitis, thus obviating the necessity of operative interference for the time being. That looks like an inning for that time-honored method of treatment, but it does not take into account the large number of patients with appendi-

citis whose chances for recovery are thereby absolutely destroyed. There is no question in my mind, and I am not alone in this opinion, that the worst thing we can do in acute appendicitis is to give the patient purgatives and food. Anything that increases peristalsis will spread the infection; purgatives stimulate peristalsis, and food does the same thing by the formation of intestinal bolus and gas. Therefore, I would lay down as the foundation of the treatment of appendicitis, the starting point, if you please, to neither purge nor feed a patient with acute appendicitis. Of course, there are some instances in which it would not be proper to operate; cases in which the patient's general condition forbids any surgical interference, but these are exceptions and only go to prove the rule.

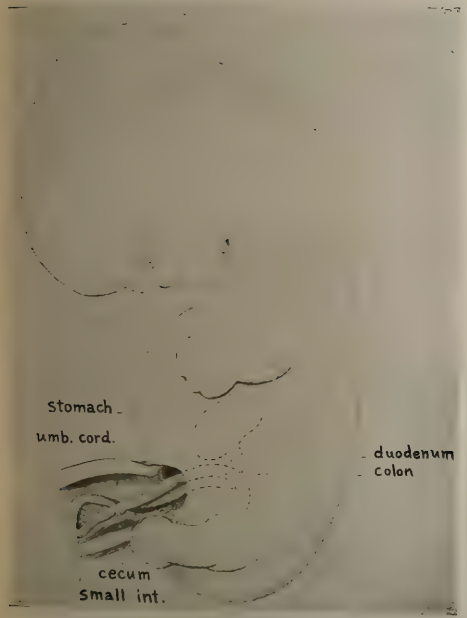
The time limit for operating on appendicitis is an important factor. The more acute the case, the earlier the appendix should be removed; since acuteness means a higher degree of infection. It is safe to operate, no matter how severe the case be, as long as the infection is confined to the appendix. The presence of spreading peritonitis is an additional indication for prompt operation, and the more peritonitis we have the more urgent the case.

In doing an early operation for appendicitis, there is usually no necessity for employing drainage. Even where there is a fair degree of peritonitis present and the right iliac fossa and pelvis are filled with serum or buttermilk-like fluid, we can usually safely close the abdomen without drainage. There are many reasons for this, which I have dealt with in another paper and will not take up your time to discuss here. But if the surgeon would feel easier about his patient to drain, I think it is all right. This matter must be left to the judgment of the operator. In other words, we have two types of cases here, those that can be closed without drainage and those that should be drained.

I think that the consensus of surgical opinion is that drainage material should be confined to rubber tubing. We have gotten far away from packing the abdomen with iodoform gauze. We older surgeons have gone through that school and gradually eliminated gauze drainage. About the only way in which I use gauze in draining these cases is in a cigarette, and I do not let the gauze project from the end of the tubing and allow it to remain *in situ* only a short while.

The next class of cases we have to deal with is characterized by rather high leukocytosis, more or less beginning local peritonitis, as a whole making the impression upon the operator that there is danger of intestinal obstruction. In the treatment of these cases I have most decided convictions. We have two things to do; first, to remove the affected appendix and, second, to prevent an ileus. I am convinced that the best way to accomplish the latter is to do an enterostomy at the time of the primary operation.

For many years it was my custom to wait till ileus developed before doing an enterostomy, but experience convinces me of the truth of the old adage that "An ounce of prevention is worth a pound of cure." We no longer fear to puncture the intestine because of the dread of a permanent fistula, since properly safeguarding the fistula by suturing the omentum



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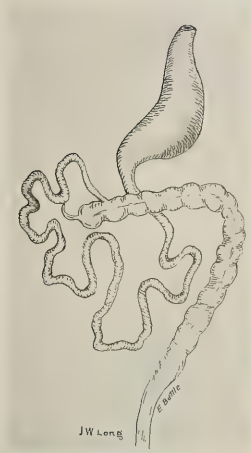

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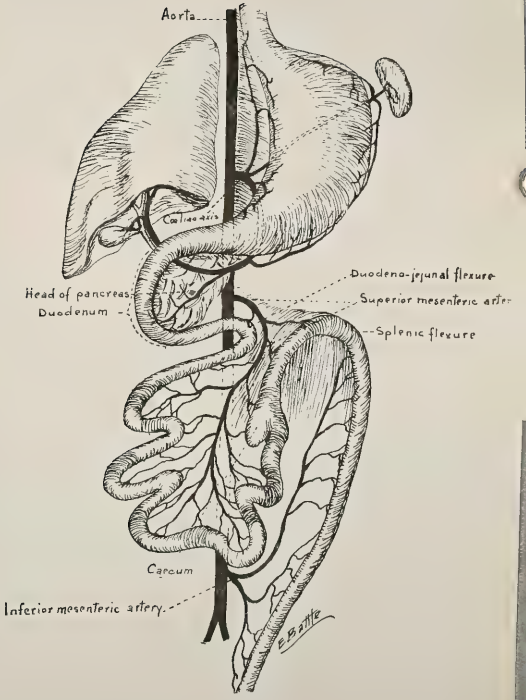

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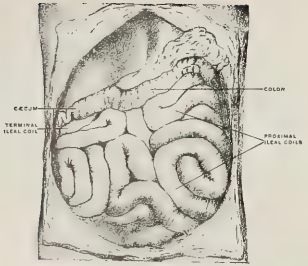

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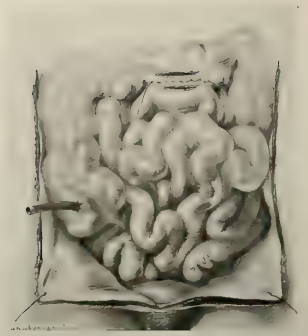

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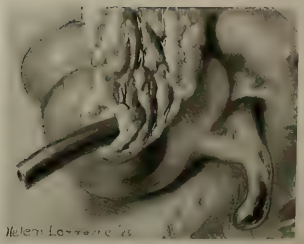

Slide IX

about the tube, as I first described in 1916, will absolutely close the fistula when the tube is withdrawn. I have had cases that did not leak a drop from the bowel after removing the tube, the omentum shutting down like a trapdoor, both closing and sealing the fistula. Therefore one need not hesitate to do an enterostomy whenever it is indicated. The best point in the alimentary canal to do an enterostomy in cases of this kind is, as a rule, the cecum. I often utilize the stump of the appendix through which to insert a tube and secure it with a purse-string suture, after which the omentum is sutured about the parts.

The drainage of the alimentary canal, safeguarded by this simple procedure, will usually prevent the development of ileus and sometimes relieve the situation after an obstruction has developed. Enterostomy does not interfere with draining the pelvis or right iliac fossa, which is sometimes necessary. I should like to emphasize the value of intestinal drainage in these cases and ask you to apply it in suitable cases and be convinced for yourselves of the great good it will do.

There yet remains to be considered the most advanced type of appendicitis, with its sequelae. I refer to those cases in which the infection has involved the peritoneum and the intestine itself, producing widespread peritonitis and intestinal obstruction. In some of these cases removing the appendix, draining the pelvis and the right iliac fossa, and even draining the alimentary canal by an enterostomy, does not avail. One reason of this is the fact that in advanced cases there are two points of obstruction, one being in the pelvic portion of the sigmoid and the other in the terminal ileum. Hence you can readily understand that even though we drain the colon through the cecum, thereby relieving the sigmoid obstruction, we still have an obstruction in the ileum which is, of course, above the drainage tube.

Let's enumerate the successive steps in these desperate cases of appendicitis. First we have an infected appendix usually hanging over the brim of the pelvis. Either the appendix ruptures or the infectious agents pass through its walls, like water through blotting paper, and attack the adjacent coils of intestines, which happen to be the terminal ileum. The bacteria invade the walls of the gut, causing its serosa to lose its luster and the muscularis and mucosa to become thick and edematous. The toxins paralyze the gut, stopping all peristalsis. Cut a gut that is thus infected, and it will stand open like a garden hose and not collapse as does the normal bowel. In addition to the actual infection of the gut itself, there quickly develops an intestinal toxemia which is more destructive to the patient than is the peritonitis.

Shortly after the ileum has become involved, the pelvic portion of the sigmoid goes through the same process that took place in the ileum, and we have an obstruction of both sigmoid and ileum. I used to wonder why so much gas accumulated in the upper portion of the abdomen rather early in these cases; since the natural history of the progress of these cases is understood it is perfectly clear that the tympany is due to the distention of the colon from the gases which cannot pass through the obstructed sigmoid. You know that it is a surgical axiom that if the bowels move the patient recovers; otherwise, he dies.

This class of cases is not only desperate but progressive. The peritonitis rises higher and higher. The intestinal toxemia becomes more and more intense, causing numerous untoward complications such as nephritis, myocarditis, and involvement of the central nervous systems. Something must be done to relieve the situation and that quickly. Now, remembering that drainage of the alimentary canal is the *sine qua non* of success, and that there are two points of obstruction, there must be two points of drainage. I have been able to save some of these patients after a low primary enterostomy by doing a high secondary enterostomy. But I think a better plan in certain cases is that of Mr. Sampson Handley—namely, to drain the small bowel into the transverse colon by an enterocolostomy just above the rising tide of peritonitis, and to drain the colon by a cecostomy as already described.

Mr. Handley reports five desperate cases of peritonitis following appendicitis treated by this method, and in December last I reported two cases before the Southern Surgical Association. By this plan the entire small intestine empties itself through the anastomosis directly into the transverse colon, and by reverse peristalsis of the colon its contents are carried through the cecal tube. In favorable cases nature overcomes the obstruction in both ileum and sigmoid, and stools pass *per vias naturales.*

DISCUSSION

Dr. J. Shelton Horsley, Richmond, Va.: I feel that possibly as we get older we become a little more interested in principles than we do in technic; and I feel that Dr. Long has done an immense amount of service, not so much in the technic of his enterostomy, which is excellent, but in calling attention to the principle. Looking back on my surgical career, which I am sorry to say is now getting rather extended, the sad part of the thing is the cases I have lost from intestinal obstruction following appendicitis and which I might have saved if I had known of Dr. Long's work earlier—or if he had known of his work earlier, for I adopted it quite soon after he wrote of it. I think Dr. Long was one of the first, if not the very first, in America to emphasize the life-saving value of a simple enterostomy. As enterostomy was done before that time, the remedy was worse than the disease. A long incision was made, and the procedure resulted fatally. Merely removing a few stitches or doing the operation under local anesthesia in the patient's bed I think has saved many lives; and I think Dr. Long is to be congratulated, because the number of cases he has himself saved by this procedure has been multiplied many times by the surgeons who have adopted it.

Regarding the proper point at which the enterostomy should be made, it seems to me Dr. Long has given a great deal of thought to that. Etiological studies have cleared up a lot we did not know about peristalsis, but there is still a great deal we do not know. There has been reported a series of experiments on dogs, of high enterostomy up in the jejunum, some with obstruction and some without. You know that procedure is recommended by Lee and others as a routine thing—enterostomy high up in the left side. But the dogs died sooner with that than without it. In a high enterostomy the patient becomes dehydrated much more quickly. Then, as Haden and Orr have shown, there is a loss of chlorides; the

chlorides fall enormously. In other words, the patient begins to have an alkalosis, which is practically the same thing as, though less talked of than, an acidosis. Besides the fall of chlorides there is something else, which nobody knows; there is more or less paralysis of the intestinal tract. It seems to me the common-sense thing is to do an enterostomy as close to the point of obstruction as you can. But if you go in the right side you are certain to get the lower coils of the ileum. If there are adhesions you may be able to break them loose, but I find myself much more tempted to do too much than to do too little.

Dr. A. G. Brenizer, Charlotte: As I understood Dr. Long's paper, in the beginning, in cases in which he suspected that he might have an obstruction, he provided for that obstruction by doing an enterostomy at the time he operated for the acute appendix, with the pus escape and adhesions, and I believe he said most frequently he did the enterostomy in the cecum. Is that right, Dr. Long?

Dr. Long: Yes, in that type of case.

Dr. Brenizer: I should think in the majority of the cases the obstruction would be in the terminal ileum. There might be some obstruction in the cecum, due to lack of motion there, due to induration of the intestinal wall. I should think if any enterostomy were done at all it would be provided above a stretch of a foot or so in the terminal ileum, and an enterostomy done in the cecum would not be so effective. Again, my conception of why anything taken by mouth would produce any trouble in the region of the cecum would be just this. Of course, we are all familiar with the fact that if we fill our stomachs in the morning, our bowels want to move. Anything taken in the stomach begins immediately to stir up commotion in the region of the cecum. My conception of anything going into the stomach would be not that it would get into the intestine and that there would be any fluid content there or gas that might distend the appendix, and so rupture it, but that motion would be set up. I know I have been told that in cases of appendicitis a purge was given but did no harm, because the patients vomited. But I think it did harm, because I have taken pictures after a barium meal and find as soon as there is anything taken into the stomach there is quite a commotion set up in the cecum. I should like to have Dr. Long explain why he does his enterostomy in the cecum, because it seems to me that in most cases the obstruction is in the terminal ileum.

Dr. H. L. Brockmann, High Point: Dr. Long's paper gives us food for thought. I want to ask a question for my own information. Dr. Long stated that it would be perfectly all right not only to do an enterostomy but to drain the pelvis as well. We all strike cases with an accumulation of pus around the appendix, which is gangrenous or ruptured, and with dense adhesions everywhere in the neighborhood. In a few such cases with low resistance I do not remove the appendix at all, because to do so and thus to break up many of the adhesions would widely spread the peritonitis and increase the shock. I want to ask him whether he considers it better in such cases merely to put in drainage, as I do, or in addition to this to do an enterostomy.

Dr. T. C. Bost, Charlotte: It seems to me the greatest evidence in favor of Dr. Long's procedure is the fact that cases that have a fecal

fistula amost invariably get well. In other words, nature in some instances provides a fistula for the escape of gas and drainage of the intestines, and as a result some cases take care of themselves and the fistula eventually closes after serving this purpose. Dr. Long's procedure establishes a safety valve (enterostomy) in anticipation of nature's demand for an opening for drainage and escape of gas, which unquestionably would save lives otherwise doomed.

Dr. Ben F. Royal, Morehead City: At the time primary enterostomy is done, is any effort made to irrigate the bowel to get rid of any toxic material it contains? If so, what is the irrigating fluid?

Dr. Ben J. Lawrence, Raleigh: I want to thank Dr. Long especially because he is talking about a condition for which we so frequently have to operate. Sometimes, I think, we get to feel that maybe we know a good deal about these conditions that we operate on frequently, and that we want to hear about more complicated things. Personally, I am delighted when a man talks about a thing that we operate on every day. I recently heard a very distinguished surgeon read a paper on appendicitis. He was talking about his mortality and said, if I am not mistaken, that out of 2,500 cases he had lost 15, bad ones, easy ones, and all combined. That sounded to me like a tremendously low mortality. I wonder if Dr. Long will tell us what he thinks about that statement, and if he has any idea what his mortality has been. He must have had thousands of cases, too.

I believe thoroughly that the method Dr. Long has described would frequently save life, but I wondered while Dr. Long was talking if we could not save just as many lives by waiting a day or two and then doing the enterostomy if necessary, thus preventing a good many enterostomies. Again I thank Dr. Long for his paper. It is always a pleasure to hear him talk.

Dr. Albert DeK. Parrott, Kinston: I should like to ask Dr. Long when to drain and when not to drain in cases of appendicitis.

Dr. Hubert A. Royster, Raleigh: Let me answer that gentleman's question before Dr. Long gets on the floor, because I know he is going to say what I am about to say,—that is, when in doubt, don't drain. Nobody is in doubt about the cases that ought to be drained; what we are in doubt about is the cases that do not need draining. The less you drain, the better for the patient; the more you drain, the better the surgeon might sleep, but the patient doesn't. Dr. Long and myself, I think, are in absolute accord about it. We used to feel that, if a case was on the border line, if we slipped in a little drain we might be a little better satisfied about it. Then we found that if we did not slip in that little drain the patient got well just the same. A very specious argument, I admit, might be this; I never saw a case of appendicitis die that did not have a drainage tube in the wound.

The question of appendicitis will not down. The last word has not been said. In fact, I am collecting and have now about twenty famous "last words" in appendicitis. They are like those famous last words we see in real life: "Watch me pass him on the curve;" "I did not know it was loaded," etc.

The possibilities of appendicitis are limitless. The mortality has been challenged in the last few months. The papers of Willis and Dugan and others have apparently shown that the mortality is increasing in the registration area in the smaller hospitals and in the out-of-the-way communities. Willis' figures have shown that in the large city hospitals the mortality rate has been reduced considerably but that in the smaller hospitals the mortality is increasing. That must be considered on both its relative and its absolute merits. It will not do to say that we have a higher mortality from statistics without analyzing them. There is a great deal in Moynihan's remark, "You can prove anything by statistics, even the truth." The question there is the question of your own personal conduct of the case. I am not quite so much in favor of the enterostomy as is Dr. Long, chiefly because I have not had so much experience and can not do it so well. I might use his expression and say an ounce of prevention is worth a pound of cure. If there is anything in our technic that will prevent obstruction, we should use it. I am not quite so sure that all of these primary enterostomies that Dr. Long performed were necessary. The fact that the patient got well does not prove that the enterostomy was necessary. I have been more concerned with peritonitis as a cause of obstruction. The patients die with septicemia, with toxemia. If you do an enterostomy you may lift that load.

I am glad Dr. Long described the work of Handley in regard to ileus duplex. So much am I concerned with it that in every case I always reach down and look at the terminal ileum and pull it up. The dropping of it down and becoming adherent to the ileopectineal line will invite obstruction. If you will look for it and release it, you will find that some cases will not have obstruction that otherwise would succumb to it.

Dr. C. S. Lawrence, Winston-Salem: The last word in appendicitis will not be said until the surgeons are all gone. I want to say that I feel very proud that we have a man in our state and profession, and a neighbor of mine, who has done so much work—original work—in abdominal surgery. We consider Dr. Long the pioneer abdominal surgeon of our state. He was one of the first to write on intestinal adhesions, the so-called Jackson's membrane. His method of shortening the round ligaments, which I use very frequently and find very satisfactory, belongs to North Carolina. His method of enterostomy has saved many, many lives. Personally, I think the enterostomy should be done early. In the cases in which I have done it in the later stages it has not given the patient much relief, because of the fact that in those cases, where the intestine is inflamed and distended, if you cut a hole in it, it stands open, as Dr. Long said. I have recently had a case of that kind that died. I did an enterostomy, and that coil of the intestine drained well. Back of that the intestine remained distended. I opened another coil, and that coil drained well, but back of that the intestine remained distended, and three weeks after the operation the patient died, not having had any peristalsis at all.

Dr. Long (closing the discussion): The discussion shows the interest of the profession in this subject. If I may exhibit the slides first, I will

then try to answer the questions that were propounded. To clearly understand this subject a brief consideration of the development of the alimentary canal will be helpful.

Slide 1. Shows the alimentary canal at the sixth week of intra-uterine life, at which time practically all of the intestines are in the umbilical cord.

Slide 2. Shows the second stage of the evolution of the alimentary canal. You see that the portion of the intestinal tube that is to become the cecum and the appendix are in the left side of the abdomen, which is normal at this period.

Slide 3. Illustrates the third stage. All the colon, even the ascending portion, the cecum, and the appendix are still on the left side of the median line. We frequently have cases of appendicitis with the cecum and the colon on the left side. I operated just recently on a young lady who had just such a condition. A point to remember is that many of these patients are left-handed.

Slide 4. As the cecum travels across the upper portion of the abdomen from left to right, it and the appendix occasionally become adherent under the liver. That explains the high position in which the appendix is sometimes found.

Slide 5. Here is another abnormality, one in which the appendix is situated behind the cecum and ascending colon, the so-called postcecal appendix.

So much for the evolution of the cecum and appendix, which explains certain abnormalities of the position of the appendix. However, it is the appendix hanging over the brim of the pelvis that is the most frequent cause of peritonitis and intestinal obstruction.

Slide 6. Note in this slide the gangrenous appendix hanging over the brim of the pelvis; see the pelvic peritonitis with its puddle of pus; observe that the iliac coils and sigmoid are definitely involved in the infection, producing the so-called "ileus duplex;" and note the rising tide of peritonitis as it spreads toward the diaphragm.

Slide 7. Indicates the location of the anastomosis of the small intestine to the transverse colon, also the cecal tube.

Slide 8. Is diagrammatic, showing in the shaded portions (a) the location of the two points of intestinal obstruction in the ileum and sigmoid, and (b) the direction of the fecal current as indicated by the arrows. The small intestinal contents are side-tracked into the transverse colon, where by reversed peristalsis they are carried to the cecum, escaping through the enterostomy tube.

Slide 9. Shows the omentum safeguarding the enterostomy tube, by the method which I devised a number of years ago.

I am sorry that I cannot in the time allotted answer all the questions. The combined method of enterocolostomy and cecostomy is applicable

only in desperate cases and is predicated upon the presence of the duplex ileus. Mr. Sampson Handley, of London, was the first to call our attention to this method, in the *British Journal of Surgery*.

In moderately severe cases in which your surgical judgment indicates that there is imminent danger of obstruction, the proper thing is to do an enterocolostomy at the time of the primary operation. I often introduce the tube through the stump of the appendix. This precautionary measure will save your patient from an intestinal obstruction and the surgeon from much anxiety. Formerly, I occasionally left the appendix in when operating, but in recent years I rarely do so, I think for two reasons: first, because we get these cases earlier; and, second, the more abdominal work one does, the more skillful one becomes.

There is still one type of appendicitis which should not be overlooked in a discussion of this kind. This type of case is characterized by the formation of septic thrombi in the appendicular group of veins, which gradually extend up through the mesenteric and portal veins to the liver, where multiple abscesses form. I have never seen a patient with this type of infection recover.

I appreciate to the fullest the interest manifested in the subject presented as shown by the discussion and the numerous questions asked.

MANAGEMENT OF FRACTURES OF THE HIP IN ELDERLY PEOPLE

(ABDUCTION METHOD).

O. L. Miller, M.D., F.A.C.S., Charlotte.

This paper is written in the interest of the better care of people who have had the misfortune to sustain a fracture of the hip. The lesion is somewhat incident to later life and occurs more frequently in the female than the male. Probably this latter is due to some basic metabolic change to which the female bones are heir, and which does not occur to such an extent in men. One can hardly consider this a scientific contribution if originality of method be the criterion. Some simple suggestions in regard to the dressing or the nursing of a patient with this lesion may be contributed, but these experiences will come to anyone industriously handling a series of fractured hips. The origin and emphasis of the so-called abduction method of treating hip fractures must be credited to Royal Whitman, of New York. His description of the procedure and his intolerance of the disuse of the method are well written into current literature.

In spite of the fact, though, that the method of treatment being presented has been well described in somewhat current literature, there are a number of good and sufficient reasons for further elaborating the subject. Some of these reasons are:

(1) Whitman's publications have been in journals of limited local distribution, apparently, while a hip joint fracture is no respecter of persons or communities. As Whitman says, there was very little progress

made in the understanding and management of hip joint fractures from the time of Sir Astley Cooper's writings on the subject in 1822 to the immediate past. That being the case, the textbooks of the last half century or more have been of little or no help to the surgeon or practitioner in connection with this subject. On the other hand, the discouragement in the textbook has left a mighty adverse impress on the medical and consequently the lay mind. The Whitman abduction method of treating these fractures should become universal, and to that end the effort in this paper is made, as it relates to our own particular section of the country.

(2) Myths, superstition, heritage (good and bad) are difficult things to get away from. There is a psychology abroad in the land, and doctors are not entirely immune to it, that when a poor old (or even moderately old) person fractures his or her hip, he or she is done for—so hands off. Nothing could be more unfair to these unhappy patients in the light of modern care of hip joint fractures.

(3) Further, there is a feeling that this type of case will probably die of pneumonia in a few days and that forestalls a decision to energetically take hold of and properly treat the unlucky person. Pneumonia is far more likely to get the untreated than the treated case. In my experience, of a number of years, I have never seen an attack of pneumonia occur in a treated case of fracture of the hip. This statement does not mean that pneumonia will not occur. However, in defense of the lessened mortality when, as Whitman says, "life saving" neglect is not practiced, Campbell reports ten deaths in 205 treated hip fractures in elderly patients, and Shands reports a mortality of five per cent in fifty treated cases over seventy years of age. It is my personal impression that these patients, whose circulatory systems are usually impaired from the general vicissitudes of life, get a wonderfully helpful physiological rest, when forcibly restricted while going through the convalescence from injury.

(4) Another and no small reason why I wish to emphasize the proper handling of these patients is that they love life and love it most abundantly. Because they have this particular accident is no reason for throwing them into the discard. The look of joy, appreciation, and contentment on the faces of these particular patients, after proper management, is probably only surpassed by that same picture on the face of a man who has recently been relieved of a blocked prostate which has given him a close call.

(5) Lastly, a lack of familiarity with the proper mechanical application of plaster-of-Paris spica casts has been a bugbear between these patients and their doctors. This is unfortunate, as the safest treatment demands the use of plaster-of-Paris; and its comfortable application must be accomplished if the desired end result is obtained.

In this paper attempt is not made to discuss in detail the special types of fractures occurring in or about the hip joint, nor the special posture the injured limb assumes. With the use of x-rays we can be assured of a specific diagnosis; and the location of the break does influence, to some degree, one's prognosis. The principles of treatment are the same for all acute hip fractures when the abduction method is being followed. It

is a pretty safe clinical guess, when an elderly person gets a fall and does not want to get up or change position, that he or she has a fractured hip. Impacted fractures are handled in the same mechanical way that all other hip fractures are handled.

The management of the fractures and the patients means getting them promptly to x-ray and hospital if possible. However, some of my most comforting cases never got to a hospital nor x-ray. This is not at all ideal, but is said in order to emphasize that no excuse for failing to handle these cases is allowable—if one really means to handle them. The patient should be placed on a spica box or spica table just as early after the accident as possible. Then with traction carry both limbs into sharp abduction and forcefully inwardly rotate the thigh and leg of the wounded side. When this is thoroughly done, apply a well padded double abduction spica cast. Whitman illustrates a single spica; but the double spica, to us, assures better position, is really more comfortable, and is very easily nursed.

These cases require a light anesthetic to relax them so one can overcome muscle spasm with reasonable traction and secure a satisfactory reduction. Usually the patient is in some shock and has often had morphin as first aid. Both make it possible and desirable that the anesthetic be short. After the immediate reduction, as a rule, the anesthetic can be discontinued and the patient will rest through the application of the spica. I have never seen any ill come from any type of anesthetic intelligently given these patients of any age. Gas anesthesia is excellent where the anesthetist is thoroughly familiar with its administration.

Opportunity has come to me to learn one well-worn quotation from Shakespeare, and I have often thought of it in connection with certain surgical situations:

> "There is a tide in the affairs of men
> Which, taken at the flood, leads on to fortune;
> Omitted, all the voyage of their life
> Is bound in shallows and in miseries."

Nothing is more applicable as a surgical principle in connection with fractures of the neck of the femur and frequently in connection with other bone injuries. There is a time in the treatment of these hip fractures in old people, and that is immediately at the time of the break, when if the thing be reduced and consistently managed, they will practically be assured a united bone and a comfortable, weight-bearing limb. On the other hand, delaying the reduction of these fractures a day or a week may cause one to miss the keenest osteogenetic desire, so to speak, inherent for a time in all living bone. This desire for union is at its height of activation immediately after injury. In the young it stands by, more or less potent, for an indefinite time and will surmount unusual obstacles to union; but in the aged this is not so true, and desire for bone union is nominal and short-lived. To take successful advantage of it means early accurate reduction of disturbed bone relations.

After the operating room, or the dressing, comes the nursing. This is most important and most interesting. The surgeon's responsibility in the nursing of these cases for the first few days exceeds the usual. The

patients are frequently a little groggy for several days; I have often had them tell me they could not remember much about the first week or ten days. A bedsore should be unheard of here. The use of a Bradford frame is desirable but not imperative. A fracture bed should be used. The patient should have fluids forced by mouth, and by rectum if necessary. They should have careful medical management in keeping with their condition. We make it a rule to turn them on their faces twice a day and keep them there until they are unhappy to be turned back. They soon rest equally as well front or back. The head of the bed may be elevated if desired. Hypostatic pneumonia is impossible if one follows this method of nursing, and if position does really have to do with pneumonia. The nurses and orderlies get on to the management surprisingly quickly, and it is impossible to hurt the patient's hip. They really never complain of their hips.

The time it takes these hips to unite is variable. This depends upon at just what level in the neck the fracture occurs and also on the age and condition of the patient. The subcapital fracture, where blood supply is most meagre, gives most concern. The farther the break is toward the trochanters, the more optimistic is the prognosis for good functional union. The immediate management of the fracture at time of injury is not affected by the level of the break. We usually keep the cases in double spica ten to twelve weeks, then change and x-ray at change to see just what we are getting in the way of union. If the bone is uniting (and it usually is if no mistakes have been made) a single spica may be applied, but this should be a long spica at first, to be worn in bed. Guarded weight-bearing in a short spica may be begun, depending on the case, from four months on. This, of course, means crutches and in the beginning a minimum amount of weight on the lame leg. Some workers use an ischial-bearing caliper splint to assist in the convalescence of the limb. All precautions may be removed between six and twelve months, and it is best to check this event with the x-ray. Do not allow weight-bearing until union is sufficient to protect itself from shearing at site of break. Of course, all of this means that one must take unflagging interest in the cases and be desirous of nothing short of the best end result possible for these old people. If one is not willing to take this interest, in the defense of surgery he should not attempt to treat a case.

Whitman says that the abduction treatment, because it is comprehensive in its scope and equally effective for every type of fracture, has raised the most neglected of all fractures to the first place in the therapeutic scale, for it is evident that in proportion to the greater obstacles to repair that it presents, the more essential to success must be favorable opportunity, since without opportunity failure is inevitable.

It would appear that the death rate under normal conditions is about 10 per cent. At least half of the transcervical fractures and all of the extracapsular type unite by bone. Assuming, then, that the two forms of fracture are fairly equal in number, one may offer a favorable prognosis both as to life and function in 75 per cent or more of all cases treated by the abduction method if it is effectively applied.

DISCUSSION

Dr. Hubert A. Royster, Raleigh: As a general surgeon I should like to offer whatever little experience of mine can add to the presentation that Dr. Miller has given us in this paper. What I wish most particularly to condemn is the attitude that he has shown you exists among the profession, and even among some great orthopedic surgeons, towards these very old women who, they say, are condemned to a life of invalidism and might as well be left alone. I want to say that none of these cases should be let alone. They deserve and should have the treatment that any other patient is entitled to, whether you use the Whitman method, which I think is one of the best and probably the easiest for the very old patient, or whether you use a method of your own. The point is to use it and not to think that in very old people you can not get good results. Not very long ago a very distinguished orthopedic surgeon was in consultation with a number of us in a case in another town, that of an old woman, and he recommended that she be allowed to lie on the bed and to kick her legs about as she wanted to, and after a while get up in a rolling chair, and not punish her with splints and nursing, etc., because it was painful. She got what was advised—a life of invalidism in a rolling chair. I want to say again that these patients ought to have the treatment that a patient of fifty would have. I saw a case not long ago, a woman of ninety-two with a fracture of the femur, just above the trochanters, with great displacement, and yet under a simple Buck's extension, with sand bags, that patient recovered, and in eight weeks took a trip to Chicago, using crutches part of the time, and changing cars once. She is now walking around with a cane at the age of nearly ninety-three. I do not regard that as due to any special skill on the part of the surgeon or nurse but to coöperation on the part of everybody, including the family, to see that the patient got every possible chance; and she did. I believe if Dr. Miller's paper teaches nothing else it will be worth while.

Dr. E. C. Judd, Raleigh: As Dr. Royster just stated, sometimes in the old patients—patients running on up in years—fractures of the hip joint are left to slip around and get through the best they can. I especially enjoyed Dr. Miller's paper because recently I have had some experience myself with these cases, having had three patients between the ages of seventy and eighty. All were transverse fractures of the neck of the femur. One was treated by the Bradford frame method, while the other two were treated with traction and countertraction. In each instance the fracture healed, and they all have useful, weight-bearing limbs.

Dr. Miller (closing the discussion): I did not try to enlarge this paper to discuss nonunion. That is most unfortunate when it occurs. The subcapital fractures are the ones in which nonunion usually occurs. The intertrochanteric type will unite. If you give them a proper position, it is surprising what excellent legs they will make. There is an attitude in the family sometimes about these old people to get rid of them. I love old people too well to sympathize with that, and if I can get good union in fractured hips in such cases and extend their lives ten or fifteen years, I get a great kick out of it—especially when division of an estate is hopefully anticipated.

SPLENECTOMY IN HEMOLYTIC JAUNDICE AND HEMORRHAGIC PURPURA, WITH CASE REPORTS

A. deT. Valk, M.D., F.A.C.S., Winston-Salem.

The etiology of practically all the primary blood dyscrasias is speculative, and the results from medical treatment are as a rule unsatisfactory. In considering two types of primary blood disturbance—namely, hemolytic jaundice and hemorrhagic purpura, this statement applies with special force; and it has only been within recent years that splenectomy has been instituted for the attempted relief of these conditions. Kaznelson is accredited with having done the first splenectomy for purpura hemorrhagica in 1916. In properly selected cases the results have been good, both objectively and subjectively; and a measure of enthusiasm for the operation in the treatment of these conditions seems quite justifiable, especially when contrasted with the failure of medical treatment. However, this same enthusiasm has doubtless resulted in splenectomy being done at times on ill-selected cases, and I need hardly emphasize the necessity for the most careful preliminary study before undertaking an operation of this magnitude.

In the study of the blood diseases, the blood-forming apparatus as well as the blood-destroying apparatus must be considered. According to Aschoff, a large part of the blood-destroying apparatus is a system of cells called the reticulo-endothelial system. One particular function of this system is to destroy the used or deteriorated red and white corpuscles, as well as the platelets. These cells are found in the sinuses of the lymph nodes, the blood sinuses of the spleen, the capillaries of the liver lobules, the capillaries of the bone marrow, in connective tissue as wandering cells, and in contact with capillaries as Rouget cells. Overaction or faulty function of these cells of the reticulo-endothelial system may occur and varies in degree as well as in the distribution of the site of dysfunction. In chronic hemolytic jaundice the dysfunction is limited to the spleen, with abnormal destruction of the red blood corpuscles, increased fragility, anemia, and jaundice resulting. The results from splenectomy in such cases are very satisfactory.

Again, in chronic hemorrhagic purpura it is readily conceivable that, with overactivity on the part of the spleen in the destruction of blood-platelets, its removal would result in permanent cure. This is the case in this form of purpura, which is characterized by a very low platelet count. In Goucher's disease there is a disturbance of the function of the entire recticulo-endothelial system so that splenectomy removes only one part of the lesion. This is true also in the acute form of purpura hemorrhagica, and splenectomy should not be done. In certain blood diseases where the blood-forming system is at fault there is an associated disturbance of the blood-destroying apparatus or overactivity of the reticulo-endothelial system. A decreased platelet count may exist with marked tendency to bleed; but in such cases, aplastic anemia and certain leukemias, splenectomy would do no more than remove a part of the overactive apparatus. In chronic hemorrhagic purpura the best opinion would seem to be that there is no diminution in the production of platelets on the part of the

bone marrow, but an increased destruction of these on the part of an overactive spleen and other parts of the reticulo-endothelial system.

In the majority of instances a mild splenomegaly exists: As the blood-platelets play a large part in blood-clotting, the degree of bleeding would naturally be directly influenced by their decrease in the blood stream. Again, there is some discussion as to whether there exists a disturbance in the permeability of the capillaries by virtue of the overactive Rouget cells, thereby facilitating the escape of blood into the tissues.

Some very interesting work has been done by injection of antiplatelet serum into animals, causing a marked diminution in thrombocytes with appearance of purpuric areas in the skin. Poisons from bacteria will produce the same manifestations, as is frequently seen in certain streptococcic infections. This may be due to direct action or to overstimulation of the elements in the reticulo-endothelial system with marked increase in thrombocytolysis. Splenectomy, in the chronic type of hemorrhagic purpura or hemolytic jaundice, in which the dysfunction of the reticulo-endothelial system is limited to the spleen, with a mild splenomegaly existing (as is the case in the majority of instances), has given satisfactory results. As we know that the removal of the normal spleen produces a rise in platelet count, this procedure seems quite logical in hemorrhagic purpura, in which the platelets are abnormally low.

Hemolytic jaundice is characterized by a persistent jaundice and in many instances critical attacks with malaise and fever during which the jaundice is intensified. Splenic enlargement is a constant finding, with a marked increase in fragility of the red blood cells and anemia. The white blood count may be normal. During the attacks the urine becomes very highly colored. In the diagnosis of hemorrhagic purpura we have the characteristic recurring attacks of bleeding and a very low platelet count, with a prolonged bleeding time and normal clotting time. The usual history is petechiae, purpuric areas, and bleeding from the gums and at times from all the mucous membranes. Differentiation from the acute type is most important, as the latter should be tided over by repeated transfusions until the bleeding stops and the patient is able to undergo a splenectomy.

Hemorrhagic purpura should not be confused with aplastic anemia, in which there is also a marked anemia with a low platelet count. In aplastic anemia there is a definite leukopenia, whereas in hemorrhagic purpura leukocytosis is the rule. There is no family history of bleeding in hemorrhagic purpura such as exists in hemophilia, and the clotting time is normal.

In the past few years numerous cases of splenectomy for hemolytic jaundice and hemorrhagic purpura have been reported. Mayo[1] recently reported 69 cases operated upon for hemolytic jaundice in which 65 were considered cured. In an excellent article by Whipple[2] 81 cases were collected and reported in which splenectomy was done for chronic hemorrhagic purpura. In a few cases reported there was some subsequent bleeding, but in the majority of instances in which the post-

[1]Mayo, W. J.—American Journal of Medical Sciences, Mar., 1926. Vol. CLXXI, No. 3.
[2]Whipple, A. O.—Surgery, Gynecology and Obstetrics, Mar., 1926. Vol. XLII, No. 3.

operative course was followed the results were excellent. Several cases were found to have a return of purpura associated with an infection, such as tonsillitis or influenza.

The two following cases are thought to be of sufficient interest to report in connection with this brief paper.

1. The first case, one of hemolytic jaundice, Mrs. McM., age 40, married, white, was referred by Drs. Johnson and Redfern and admitted to the Baptist Hospital June 15, 1925.

The patient complained of weakness, pallor and dyspnea. She had pneumonia eight years ago with good recovery. Influenza yearly for the past six years. No jaundice. Five miscarriages. One child living. During the past two years the patient has had four transfusions. She has always been rather pale, but during the past three years has developed a definite yellowish tint of the skin not sufficient to be called a frank jaundice. During this time there has been more or less constant digestive disturbance. Examination on admission was practically negative except for marked pallor with lemon-yellow tint to the skin. The heart and lungs were quite clear. Abdomen negative except for a slightly palpable spleen. R. B. C. 3,170,000. Hb .60%. W. B. C. 9,000. Differential count normal. No nucleated reds. Vital stain showed about 20% reticulated reds. The red cell resistance with hypertonic salt solution showed initial hemolysis at 48 and complete at 44. Operation July 3, 1925. Splenectomy, which was somewhat tedious owing to marked adhesions, size of spleen and a very short pedicle. The spleen was markedly enlarged. The patient reacted well, and postoperative course was uneventful. When discharged on July 23, 1925, the R. B. C. was 4,240,000, Hb. 85%. A recent communication from this patient states that she has gained 25 pounds and is quite well in every respect.

2. The second case is one of hemorrhage purpura, J. S. M., age 40, married, white. Admitted to Memorial Hospital Jan. 14, 1926, referred by Drs. Hurdle and Redfern. The complaint was "hemorrhagic purpura." The family and past histories were unimportant so far as the present illness is concerned. This dates back about four years, when he began to have hemorrhages into the skin of the arms and legs. The joints have been involved, being swollen and painful. Eighteen months ago he had several abscessed teeth removed after which the attacks were diminished in frequency, and during the past year he has had only one attack, this being two months ago. These attacks last about a week or ten days and are occasionally associated with nausea and vomiting. During the last attack, the most severe, the patient had petechiae, purpuric areas; and bleeding was more marked, with bleeding from practically all the mucous membranes as well as a large quantity of blood in the urine. During the course of his disease he has had numerous transfusions with some benefit. Examination on admission to the hospital was quite negative other than a palpable spleen and very interesting laboratory findings. R. B. C. 3,840,000. Hb. 60%. W. B. C. 6,100. Blood plateets 95,000. The R. B. C. showed some poikilocytosis and anisocytosis and were paler than normal. Bleeding time 15 minutes; clotting time 4½ minutes. Operation January 16, 1926, splenectomy. The spleen was rather adherent, with a very short pedicle. It weighed 260 gms. The patient reacted well following operation but on the second day developed an acute attack of purpura with petechiae, purpuric areas over the forearms and ankles, and some swelling of the ankles and wrists. He had slight nausea and vomiting and a rather marked amount of blood in the urine. This persisted for three

or four days with some elevation of temperature during this time. The subsequent course was uneventful, and the patient was discharged on Feb. 4, 1926. The blood platelets showed a very definite increase immediately following operation. This patient has had no further attacks since the operation and his condition is quite satisfactory.

DISCUSSION

Dr. A. G. Brenizer, Charlotte: I recall one case of hemolytic jaundice I had, and the result there was a revelation. Dr. Allan was responsible for working up the case; I simply removed the spleen. Later I saw the man with Dr. Allan, and I would not have recognized him.

Dr. Valk has given us such an excellent paper, and most of us know so little about this subject, that I am afraid to say much.

Dr. E. A. Lockett, Winston-Salem: In one of those cases Dr. Valk spoke of a man with hemorrhagic purpura having previously had infected teeth removed, after which there was a temporary improvement. I should like to cite a case I recently saw in consultation at home, a young man of twenty-four, who is an operator of a moving picture electroscope. Whether the rays have had anything to do with this aplastic anemia, or not, I do not know. This man has had two attacks. He improved and tried to go back to work. About four weeks ago he became very much jaundiced again, and the red count was then 1,000,000. That man evidently has some gall-bladder involvement, too, as he has some definite tenderness over the gall-bladder. He evidently has Banti's disease.

ACIDOSIS AS A CAUSE OF ACUTE ABDOMINAL PAIN

Douglas P. Murphy, M.D., Rutherfordton

With what seems to be increasing frequency we are noticing an intimate relationship between acidosis and acute abdominal pain. This observation has been made chiefly upon children in whom a previous diagnosis of acute appendicitis has been made. Besides the classical signs of the latter, heavy acetone reaction in the urine and a heavy chloroform-like odor upon the breath have been present. In all instances, treatment of the acidosis has produced rapid and complete recovery from abdominal symptoms. This observation has led us to suspect acidosis as a cause of abdominal discomfort and pain.

Current literature makes little mention of acidosis as a cause of pain. McGuire states that in acidosis there is often abdominal distress and gastric tenderness such as to suggest appendicitis. Riesman, in discussing the extra-abdominal causes of acute abdominal pain, believes that there is some relationship between the two. He reports an instance of acute right-sided abdominal pain in a diabetic from whom insulin had been suddenly withdrawn. Immediate administration of the remedy brought about a prompt cure, with disappearance of all symptoms of appendicitis. Marriott, on the other hand, in a personal communication said that "Acidosis rarely, if ever, causes abdominal symptoms, either vomiting or pain". He believes that the abdominal symptoms are al-

ways due to some other underlying cause. It has been the experience of our colleagues in general practice that abdominal pain is frequently associated with acidosis in children, no other cause being found.

A typical instance of this association occurred in a ten-year-old girl, who had previously been diagnosed as having acute appendicitis. When seen by us she had been suffering with abdominal pain as a chief symptom for four days, which had been gradually becoming worse. Her temperature was 100 and her pulse 104. The lungs were clear. The abdomen was slightly distended and somewhat tender, especially on the right side. The W. B. C. was 25,000 and the urine was negative except for a heavy acetone reaction. The breath also had a marked acetone odor. Operation was postponed and treatment was directed towards correcting the latter. Forty-eight hours later all signs and symptoms of acidosis and abdominal distress had completely disappeared.

It cannot be denied that this patient did not have appendicitis, and the same may be said of our other patients presenting similar symptoms. If appendicitis was not present, some other obnormality of function of the gastro-intestinal tract may have been the cause. The speed, however, with which these patients have responded and the completeness of their relief when treated for their acidosis lead us to believe that acidosis may be an important factor in the causation of the abdominal symptoms.

With these observations at hand, we feel that in examining all patients with acute abdominal distress, especially children, it is very important to determine the presence and degree of acidosis; and that treatment directed towards improving the acidosis may obviate an unnecessary operative procedure. It further leads us to suspect, although we have not absolute proof, that acidosis is a cause of acute abdominal pain.

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DISCUSSION

Dr. Hubert A. Royster, Raleigh: I can not refrain from saying something about this paper because of its timeliness, and because of Dr. Murphy's attitude. The question of acidosis in children resembling appendicitis has been a topic of conversation and discussion for about four or five years. Among the pediatrists there has been a considerable question as to whether these recurring cases of cyclic vomiting in children, with or without a proper diagnosis of acidosis, might not be connected with recurring attacks of so-called chronic appendicitis. Dr. Root and I studied it for a good many years. One of the cases was my own boy of about nine, who for a number of years had attacks of nausea and vomiting without any apparent rhyme or reason. In none of these attacks did we discover acidosis, but there was something quite

wrong. It resembled acidosis and certainly was cyclic vomiting. At the age of fourteen he had an explosion one morning; he came into my room with pain and vomiting. He had a high leucocyte count, and in an hour and a half we had his appendix out. Since that time he has had no more attacks. Whether they were attacks of acidosis, or whether the nausea and other phenomena were due to the appendix, it is hard to say. The question was studied in Richmond by Dr. McGuire. Back of that were studies by Dr. Newton, who has since died, in connection with Dr. Gray, the roentgenologist. This question has received general discussion, I think, all over the country.

I believe Dr. Murphy is right in calling attention to the fact that pure acidosis can cause abdominal pain. We might inquire, however, if he is quite sure if this patient who got over the attack of acidosis did not have appendicitis and later will not have another attack of appendicitis. I could not be positive about it unless I could see the appendix. Of course, they recover from the attacks of appendicitis as they do from acidosis. At any rate there is some disturbance of the metabolism. Those things do not arise from themselves; there must be some particular thing that causes them. In the case of the diabetic there would be reason to believe that was a pure case of acidosis. Moreover, we know almost anything can produce abdominal pain, no matter where the lesion is located.

I think this is a very pertinent subject for discussion, because for the most part I am very much more interested in diagnosis than I am in technic.

Dr. J. W. Tankersley, Greensboro: I am very much interested in Dr. Murphy's paper and also in Dr. Royster's discussion of it. Since the first of the year I have had occasion to operate on three cases of acidosis in babies, or so-called acidosis, the diagnosis having been made by what I consider expert pediatricians—good men. In each case I removed an extremely bad appendix, and in one case the appendix was ruptured. These cases were carried along with a diagnosis of acidosis. I question if those cases of pain and fever are really acidosis, for there is something back of it. What is it? Acidosis means nothing more to me than if you say a patient has fever; there is some cause back of it. These cases of mine were babies: one fifteen months old, one about twenty months old, and the third about three years old. All three cases were carried along as cases of acidosis, till finally a diagnosis of appendicitis was made, operation confirming the diagnosis in each case.

Dr. Murphy (closing the discussion): Acidosis is of interest to us at the Rutherford Hospital because we are rather conservative surgically. When a patient presents himself with a diagnosis of a surgical condition, we usually try to learn all the contra-indications to operation. We take the standpoint that thereby many patients will be saved unnecessary operation or will have the operation so much delayed that we shall know a good deal more about the patient before the operation is finally performed.

As to acidosis, I know nothing about its chemistry, or practically nothing. There seems to be no doubt that it is an indication of some

disturbance. It is more frequent in children and is a result, in many instances, both of fasting or constipation, or some indiscretion in diet. We have a worker in our hospital who has a number of small children. They have acidosis frequently, and their first symptom is abdominal pain. They have been seen in consultation by several of our staff. They present no sign of appendicitis, and on treatment with sugar and soda they apparently clear up.

We should watch for acidosis and consider the acidosis from the standpoint of whether it is going to be increased from the anesthetic, and, if so, delay the operation. Personally, I know very little about acidosis as a cause of pain. I should be very much interested if others would report their observations. Then we who are selecting patients for operation shall be in better position to advise.

CARCINOMA OF THE BREAST AND ITS TREATMENT BY SURGERY, X-RAY, AND RADIUM

H. Hartwell Bass, M.D., Philadelphia.

(A brief summary of the vital statistics of cancer and other malignant tumors as obtained from the Department of Vital Statistics, Bureau of the Census, Washington, D. C., with special reference to the treatment of carcinoma of the breast by surgery, x-ray and radium.)

The vital statistics of the several states having registration laws are herewith briefly reported.

The number of deaths from cancer and other malignant tumors was 86,794 in 1923, corresponding to a crude rate of 89.4 per 100,000 estimated population, as against 86.8 in 1922 and 86.0 in 1921. Comparison of the crude rates of death from this cause, however, magnify somewhat the increase in mortality, as crude rates do not take into account the fact that the percentage of population at older ages is annually increasing and also that the improved methods of diagnosis have their effect. No mention is made of the improved methods of treatment, nor the question of early diagnosis, and the vast number of patients that are cured who in the past were considered hopeless. These crude rates for the states having registration laws showed a rate of 64 in 1900, and of 99.6 in 1920, suggesting an increase of 56%, whereas the adjusted rates were 60.7 and 87.8, respectively, or an increase of 45%. The adjusted cancer mortality rate was higher for 1923 than for 1922. The highest cancer mortality rates reported were:

Rhode Island	100.9
New York	102.6

The lowest rates reported were:

Tennessee	54.9
South Carolina	52.2
North Carolina	56.8

Nine states, shown by color for the years 1922 and 1923, have a higher adjusted rate than in 1923. Maryland has the highest adjusted rate for both the white and the colored population, with 100.2 white and 91.8 colored, although the complete statistics show very little difference in the

mortality of the two races. The white race is more prone to lesion of the skin and mouth; the colored race shows an increase in breast and uterine cancer.

The female mortality rate from cancer was 48,764, or 56.3 per cent.; while the male rate was 37,990, or 43.8 per cent. The total number of deaths reported from cancer of the breast was 7,740. Statistics show, year after year, that more than 50 per cent of the deaths from cancer are females. Cancer of the mouth, skin, stomach and liver are more prevalent in males than in females; while the greater mortality rate of females is due to lesions of the breast and uterus. Sixty per cent. of the tumors of the breast are malignant (DaCosta). The remaining 40 per cent. should be treated as potentially malignant, as no one knows where and when malignancy begins. Cancer of the breast is classified according to location of the tissues involved—those due to the proliferation of the epithelium of the acini as acinous cancer, and of the ducts as duct cancer. The former is the more common and is much more prevalent than duct cancer. Usually there is much connective tissue and but little parenchyma in the growth (scirrhoma). In some cases there is little connective tissue and much parenchyma (encephaloid or medullary cancer). If colloid degeneration of the parenchyma, or stroma, occurs, the growth is spoken of as colloid cancer. Paget's disease may be considered as precanerous, but most pathologists classify it as carcinoma of a very slow growth. Cancer en cuirasse could be classified as a centrifugul permeation of the cancerous capillary lymphatics originating from the primary growth. This process can be very extensive, involving quite a large area of the body surface. Medullary cancer in the pregnant or in the nursing mother seems to be the most rapidly malignant of all types of cancer, the patient living only a few months and often having metastases in the other breast.

DaCosta says that in more than 60 per cent of the cases the glands of the axilla are felt to be enlarged when the patient applies for treatment, and because the surgeon cannot feel them is no proof that they are not diseased. The question of inoperability depends as much upon the surgeon as upon the extent of the disease. What some would call inoperable would not be considered so by others; but the concensus of opinion seems to be that when a patient has axillary plus supraclavicular involvement of the glands, metastasis in some other portion of the body may be expected and operation would only hasten the end. The individual patient has a great deal to do with the results to be obtained. Some do not stand surgery well; others are radio sensitive; some will stand a great deal of radiation without apparent effect. Other diseased conditions may complicate the treatment, such as diabetes and syphilis. The patient should not be treated nor an operation performed without a thorough physical examination, including blood chemistry and x-ray studies.

Carcinoma of the breast cannot be treated intelligently without a knowledge of the anatomy of the lymphatics, and to this subject I therefore briefly call your attention. Lymphatics are found in nearly every structure of the body containing blood-vessels. They are both superficial and deep. The superficial lymphatics, lying under the integ-

ument and in the subcutaneous tissue, accompany the superficial veins and join the deep lymphatics in certain places by perforating the deep fascia. The deep lymphatics, which are fewer in number and larger than the superficial, accompany the deep blood-vessels. We are taught today that the lymphatics are a closed system, with no portals of entrance as was taught several years ago. The tissue juices enter the lymphatic vessels by osmosis or by dialysis. Foreign bodies or substances enter by force or by breaking through the vessel walls and are assisted by the pumping or suction action caused by respiration and circulation, aided by the muscular movements of the body. The lymphatics, including the lacteals, discharge their contents into the veins at two points, namely, at the angle of the junction of the subclavian and internal jugular veins, on the left side by means of the thoracic duct and on the right side by the right lymphatic duct.

The lymphatic glands are small oval bodies, situated in the course of the lymphatic and lacteal vessels, so that the lymph and chyle pass through them on their way to the blood. These glands present a slight depression on one side, the hilum, through which the blood vessels enter and leave the interior. The efferent lymph vessels also emerge from the gland at this spot, while the afferent vessels enter the gland at different parts of the periphery. In section, a lymph gland displays two different structures: an external or light color, the cortical; and an internal or dark color, the medullary. The cortical structure does not form a complete investment, but is deficient at the hilum, where the medullary portion reaches the surface of the gland; so that the efferent vessel is derived directly from the medullary structure, while the afferent vessels empty into the cortical substance.

The superficial lymphatic vessels of the breast and chest wall pass through the axillary lymph glands, while the vessels nearer the median line pass through the subclavian lymph glands. There is a free anastomosis between the superficial and deep lymphatics. The deep lymphatics, after receiving the anastomatic branches of the aponeurotic covering of the chest, pass through the chest wall, by way of the intercostal spaces, and take a course between the parietal pleura and internal chest wall upward to their destination.

It must be borne in mind that while the lymphatics are classified as deep and superficial, they are one and the same system, freely anastomosing with each other and forming a complete network throughout all of these structures.

Handley, in his book on carcinoma of the breast and its treatment, has summarized his conclusions as follows:

1. That carcinoma spreads centrifugally in all directions from the point of origin by its permeation of the lymphatic plexuses.

2. That curative and reparative processes inadequate for a cure are a normal part in the cancer process.

3. That the process of inflammation and fibrous tissue formation are the principal agents in the defense of the body against carcinoma, but they do not come into play until the cancer cell exerts pressure upon its surroundings or degeneration sets up chemical irritation.

4. That invasion of the serous cavities by cancer cells is an event of critical importance in the process of dissemination.

5. That the embolic theory of dissemination is true only in exceptional cases.

It can be readily seen from the study of the lymphatic system how blocking a series of glands by cancerous invasion will produce a regurgitation through other lymphatic channels, thereby allowing a metastasis to take place in other areas far distant from the primary lesion or the secondary glandular invasion. The embolic theory of metastasis is that small particles of cancer cells pass through the lymphatic system and enter the circulation through the lymphatic duct; but this, on account of the construction of the lymphatic glands, is practically impossible. Another embolic theory which seems to have credence is that the cancerous mass surrounding the small venules gradually permeates their walls and enters the circulation. This might be possible, according to Rodman, but seldom takes place. The concensus of opinion seems to be that metastasis takes place through the lymphatic system alone, whether by parietal dissemination, centrifugal permeation, of by other means of invasion. No tissue of the body is exempt from metastasis, and the usual order of invasion is the axillary glands, the subclavian lymph glands, then the contents of the chest, as the mediastinum and pleura; the abdominal organs, the bones of the pelvis and of the spine, and other structures, reserving the nervous system until the last, this being the most resistant. DaCosta has well said that in cases of spontaneous fracture it might be well to examine the patient's breast for the primary cause, as the size of the lesion is no criterion of metastasis.

Until the discovery of radium and the Roentgen ray, the treatment of cancer of the breast was by surgery alone, and the surgeon considered his results excellent if thirty per cent. of his patients reached the five-year period. He at first referred his inoperable cases to the radiologist, hoping that some result might be obtained or that life might be prolonged. This, in a measure, was accomplished. Later, he referred his cases for postoperative treatment, and now in more recent years most surgeons are advocating both pre- and postoperative radiation.

The plan of treatment advocated by the Clark-Bass Hospital, Philadelphia, and which has been followed for a number of years, was first evolved by Dr. William L. Clark. The devitalizing effect of massive doses of x-ray radiation upon normal tissue had been observed. The lethal dose, when applied by high tension short wave x-ray in one or two treatments, not only had an influence upon the cancer cells but on normal tissue as well, with the result that the patient's resistance was lowered; and should there be a recurrence of the growth, the limit of radiation by this method had been reached and the patient hopelessly doomed.

The action of the electron upon tissue, whether by ionization, electrolysis, or direct destruction of the cancer cells, only hastens nature's effort—fibrosis. A number of cases treated by massive doses of x-ray and radium have been observed where the lung structures, far removed from the cancerous invasion, were excessively fibrosed. The normal tis-

sue's vitality was lowered and the patient soon succumbed to secondary invasion. This result led to further research into this method of treatment.

We advocate the lethal dose, but believe it should be divided into daily fractional doses extending over a period of time. From our observations of this method of treatment, we draw the following conclusions:

1. Normal tissues are conserved and, in many instances, benefited, by round-cell infiltration, which represents the natural defensive process against the invasion of the cancer cells.

2. Excessive fibrosis, especially through the lung tissue, is limited and, in a measure, avoided.

3. Slow and repeated radiation may produce, by cytolysis of the cancer cells, antigenous substances which would, by production of antibodies, increase the resisting power of the patient.

4. Radiation can be continued, when necessary, for an indefinite length of time without detriment to normal structures and the patient's general health.

5. An improved condition immediately from this method of treatment in a recurrence after the limit of radiation of the massive dose method.

6. X-ray burns are virtually unknown, there being ample time between treatments for observing possible skin irritation and consequently prolonging the intervening periods as may be necessary.

Inoperable cases with axillary and supraclavicular involvement have cleared up and shortly thereafter became operable.

Knowing the dangers of early metastasis, and that the size of the lesion is no criterion, we advocate as a routine procedure a preoperative radiation in fractional doses. For further details, I refer you to Dr. William A. Clark's paper, "Second Report upon Fractional High Voltage X-Radiation Technic in Certain Inoperable Malignant Lesions—Why Preferred to the Massive Dose Method," read before the American Electrotherapeutic Association at Chicago, September 15, 1925.

The object of the present paper is not to condemn surgery but to assist the surgeon. Closer coöperation should exist between the surgeon and the radiologist, both recognizing that best results can be thus obtained.

No attempt will be made to describe the different operative procedures in the treatment of cancer of the breast. References only will be made to certain surgical acts found beneficial in our work at the Clark-Bass Hospital. We strongly recommend preradiation, and allowing sufficient time between preradiation and operation for the full effect of radiation. We believe the advantageous time to operate is when fibrosis is at its maximum—that is, before secondary contraction or shrinking takes place in the tissue. The process of repair takes place by hypertrophy and by hyperplasia of the cellular elements. It is impossible to completely destroy by radiation all cancer cells in the tissues, but when fibrosis has

reached its maximum these cells are devitalized and their reproductive power impaired; while after contraction they may be mechanically forced out into tissue again and their activity restored. The advisability of radical procedure from a surgical standpoint is to be doubted. Diseased tissue only should be removed. To break down nature's barrier by destroying normal lymphatic glands is not logical. The gland structure itself acts as a filter for the lymph current and prevents diseased tissue from entering the bood stream. Involved glands when removed surgically should be done as primary lesions, and not as secondary. From a study of the lymphatic supply of the breast and surrounding structures, the impossibility of removing all tissues in the area subject to metastasis becomes evident. If the lesion is located on the outer quadrant of the breast, then operative procedure has a chance to remove the possibility of metastasis; but if the lesion is on the inner quadrant of the breast, then surgery alone cannot produce relief, as the lymphatics lead directly from the lesion (through the second, third and fourth intercostal spaces) to the deep structures of the chest, including the mediastinum and inner structures of the chest wall and also to the other breast.

Care should be exercised in handling the breast, as there is a possibility of dislodging cancer cells and thereby producing an early metastasis.

Less importance is attached to the kind of lesion than to the type. All malignant growths are classified according to the preponderance of differentiated and undifferentiated cells present in the lesion. Where there is preponderance of undifferentiated cells, the chance of metastasis is greater and the tumor more malignant, and *vice versa.* The classifications are made according to Broders of the Mayo Clinic, and should be done by frozen section.

The response of the lesion to preradiation is a test to the results that may be expected. Cases that do not respond to preradiation treatment by fractional technic can not hope to be relieved by surgery if there is a metastatic involvement. Both prognosis and statistics could be improved if more attention were paid to the individual lesion or type and not so much to the kind of tumor.

Some types of cancer are best treated by radium, depending upon the location of the lesion and the condition of the patient. The use of radium element is advocated in the form of needles or pads and not the emanation seed or bare tubes. It has been our experience that the emanation seed acts as a foreign body in the tissue and eventually produces trouble. The time factor cannot be taken into consideration with the emanation seed, and ofttimes they are planted too close to bone, and necrosis results. In this connection, I refer you to a paper read before the American Radium Society at Chicago in June, 1924, entitled "Objections to the Use of Radium Emanation in Bare Tubes, with Clinical and Historical Observations," by Drs. William L. Clark, J. Douglass Morgan and E. J. Asnis. Radium needles are inserted into the zone wall surrounding as well as into the tumor mass. The axillary glands, when not involved, can be radiated with the radium pad, mapping this region into squares and radiating each square for a certain

period of time. Thus complete crossfire of the entire area is obtained and thorough radiation of any structures which might be subject to metastasis. Each diseased gland should be radiated by inserting into it the needles under the same procedure as with the primary lesion.

High frequency currents, in the form of desiccation and coagulation, are effective in those lesions of the breast where there are raw bleeding surfaces.

Our experience with the so-called radio knife, as described by Wyeth of New York, has not proven of any special advantage in breast amputations. If the current is sustained sufficiently long to control bleeding, then the tissue is charred and healing is not by primary union. If the current is used to make a clear-cut incision, then hemorrhage is not controlled and the use of this knife has no advantage over the scalpel.

Postoperative x-ray radiation should be employed in all cases with the hope of destroying any metastasizing cells which might have been dislodged during the operative procedure. Fractional x-ray radiation is advocated in this procedure. Several series of lethal doses should be given. Postradiation should follow the operation as soon as the physical condition of the patient will allow. A series of daily radiation of from three to five minutes to each portal should be given until the patient has received the lethal dose, using as many portals as are necessary to produce a complete crossfire. Two series of treatments generally suffice, save in exceptional cases. The patient is, as a rule, given a rest period of from three to four weeks between series.

No class of patients require closer watching and observation than do those with carcinoma of the breast. They should be examined and inspected at stated and frequent intervals and, at the first evidence of recurrence, treatment resumed.

Postoperative radiation by radium can be employed with the same technic as in preradiation, treating each lesion as might be necessary.

DISCUSSION

Dr. W. D. James, Hamlet: Not having heard Dr. Bass's paper I can only tell you our experience. If there is a lump in the patient's breast, and the patient is over twenty-five years of age, we do a radical operation and remove all glands in the axilla that we can palpate. We feel that the axilla is infiltrated, and we give the case deep therapy before and after operation. The number of treatments we give before operation depends upon how soon we see the case. If we are able to get the patient to come back for a few times, we give three treatments, fractional doses. We divide this up and give one anteriorly and one posteriorly until we have the glands so that we can not see them.

The type of case every surgeon sees is the horribly neglected case, where the patient has not seen the family physician, but is seen only after someone in the family has located the trouble by a stain on the shirtwaist, especially if it is an old maid. In a case like that we dissect, remove the entire breast down to the periosteum of the ribs, and go up into the axilla and remove all the glands we can palpate. We tell the patient she must come back once every thirty days for a period of twelve months. Then if that case metastasizes into the spinal cord or mediastinum, we feel that we have done all we can do. In cases like this we

give the violet ray repeatedly, working up to thirty minutes' exposure a day. We also use radium needles, but there are still some of these cases with which you cannot do anything.

I believe a certain number of cases will not metastasize; and by doing a radical operation, even if you can not get the skin edges to meet, and using radium and x-ray, it is surprising what results you will get. Even in some of these cases that are horribly inoperable radium and x-ray will frequently prolong life, and add much to the comfort of the patient.

Dr. H. B. Ivey, Goldsboro: I want to ask Dr. Bass if he removes the breast with the high frequency, or if he uses the knife. I want to ask him also about his radium technic, and if he continues that even in apparently hopeless cases if there is not metastasis.

Dr. Bass (closing the discussion): As to the question of radium, there are two methods that we use. (1) The area to be radiated is mapped out with a flesh pencil in squares about 1 1/2 inches. The radium is applied in pads of 50 milligrams each, screened with 4 millimeters of lead, at 1/2 inch distance. Each area is radiated for a period of four hours. Two pads of 50 milligrams each may be used if desired. These should be placed at distant points from each other—that is, the pads should be placed as far apart as possible so as not to over-radiate any area, and get a complete crossfire. (2) Radium needles may be inserted into the tumor mass, and in the area immediately surrounding it. The area desired to be radiated should be mapped out so as to arrange the needles so that they may be about 1 1/2 inches apart after they are inserted into the tissue. The time factor here depends upon the character of the growth and the amount of previous radiation that the patient has had. We have found that from 12 to 18 hours is the proper time factor.

We depend more upon x-ray radiation in cancer of the breast, as the results are more gradual and the patient can be inspected daily and over-radiation avoided. We are as thorough with our surgery as the indication demands; but we are more thorough with our preoperative radiation than ever, as we have repeatedly observed cases that were referred as inoperable, with axillary and superclavicular involvement, become operable in a very short time.

SUMMARY

(1) From a study of the lymphatic supply of the breast and surrounding areas surgery alone cannot be relied upon to remove all diseased tissue.

(2) The action of radium and Roentgen rays upon the diseased tissue is entirely different in the sublethal and lethal dose.

(3) Preoperative radiation should always be employed and sufficient time permitted to elapse before surgical procedure is undertaken.

(4) The cancer problem can not longer be viewed as a definite pathological entity belonging to the field of the medical profession alone, for it is equally important that the physicist, the chemist, and the histologist each has his part to perform; and thorough coöperation with one another would lead to better end results.

(5) If more attention were paid to the individual typing of tumors both prognosis and statistics would be more accurate.

THE MANAGEMENT OF THE MALIGNANT PROSTATE AS CONTRASTED WITH BENIGN HYPERTROPHY

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In a recent article we wrote upon the "Pre- and Postoperative Treatment of Prostatectomy". At that time we reviewed the indications for prostatectomy, the management of the pre-operative preparation, the criteria of operative preparedness, the postoperative care, and results.

Our review was intended to cover the average benign case. There are, however, certain conditions which alter this plan of management. Chief of those is malignant disease of the gland itself or of the bladder. It is our purpose at this time to compare the management of a case of malignant disease of the prostate. If we may be permitted, we would outline briefly the management of the benign case somewhat as follows:

PRE-OPERATIVE TREATMENT

1. The institution of proper drainage with the gradual reduction of the residual urine; then continuous drainage when the bladder can be left empty.

2. The control of infection by irrigation, forced water, alkalinization, and, if desired, the administration of genito-urinary antiseptics. During this process the patient is studied with a view of determining the most suitable time for operation.

CRITERIA OF OPERATIVE PREPAREDNESS

The general clinical condition of the patient should be brought to as near normal as possible.

Special attention should be paid to the cardiac function, the blood pressure, and functional renal tests.

One should endeavor to have the patient as nearly physically fit for a major operation as possible.

The 'phthalein excretion should be stabilized at a point as near normal as possible.

The blood pressure, which usually drops immediately after the institution of drainage and decreases until the patient has passed through the reaction, should return to its normal level and remain stable. In regard to the chemistry of the blood, we regard for all practical purposes the determination of the non-protein nitrogen and the preformed creatinin to be of most value. An acute kidney function deficiency will be indicated by a rise in the total retained nitrogen long before there is an increase in creatinin. With back pressure on the kidneys, due to residual urine, there is retention of nitrogen in the blood. Creatinin retention denotes chronicity and is of considerable prognostic value. With reduction of the residual urine, as the patient passes through the drainage stage, the retained nitrogen decreases and, if there has been no permanent kidney damage, reaches and remains within normal limits. Usually at this stage the 'phthalein excretion becomes stabilized at its best figure.

The treatment of the infection that usually follows repeated catheterization is of great import. These cases with large amounts of residual urine should be handled with special care to prevent infection. After the institution of continuous drainage the patient is much better able to take care of the resulting infection.

The time required for complete preparation of the patient varies from days to months. It should be remembered that if the patient does not improve by drainage he will likewise show no improvement from the operation, since the removal of the prostate gland does nothing more than give drainage.

Postoperative treatment begins immediately after the operation and is concerned first chiefly with shock and hemorrhage. Then proper drainage of the bladder must be instituted at once. The maintaining of the fluids of the body is essential, and the administration of fluid may be performed as indicated. Postoperative rise in temperature usually points to improper drainage, pulmonary complications or epididymitis. The patients are encouraged to sit up early, and if their general physical condition is good they are encouraged to walk about the hospital within seven to ten days after operation.

The question often arises as to how the management of the malignant case differs from that of the benign. The stage of the disease when first seen, the symptom-complex, and the type of urinary obstruction, all must be considered as in the benign case. The treatment of the condition must be directed towards the urinary obstruction and the relief of the other symptoms. It is especially valuable to review at this time the evolutionary development in the management and treatment of the malignant case. The end results of the past leave much to be desired, so we feel that a canvass of the best opinion as well as a review of our own results will be of value in standardizing therapeutic procedure.

One man in 12 has prostatic trouble sometime during the prostatic age. Of these about 20 per cent. have cancer of the prostate.

In the 267 glands removed in our clinic and examined microscopically 14.2 per cent. were malignant. Aside from these there were a number of advanced cases which were not operated, but which would increase the percentage of malignancy to 20.1 per cent.

The diagnosis of malignancy before operation is the most important point. Gilbert Smith classifies the symptoms under the heads of (1) obstructive, (2) irritative, (3) ulcerative, and (4) metastatic. The obstructive symptoms are difficulty in voiding or complete retention. The irritative symptoms are frequent and painful urination with small amounts of residuum, while the chief ulcerative symptom is hematuria. All those may be present in similar degree in both types of prostatic disease. The metastatic symptoms of pain in the back or along the sciatic nerve are confined to the malignant group. The malignant prostate, by rectal examination, is usually described as being of stony hardness and fixed; there may be or may not be enlargement. The majority of the cases we have seen have been of normal or less than normal weight. The average weight of our malignant glands is 18.6 gm.

The process may begin or may be discovered as being confined to a small nodule on one side or the other which eventually extends through-

out the gland and, because of the lymphatic drainage, shows early involvement of the seminal vesicles. The early metastasis to the bones has been noted by all students of this subject. The order of bone metastases, as given by Bumpus, is pelvic bone, spine, femur and ribs. The radiograph has become of great value in making an early diagnosis. Bumpus reports that one-third of these patients have bone metastases at first examination. Barringer has gone so far as to strongly advise that all male patients of age fifty or more be examined particularly for malignancy of the prostate.

TREATMENT

Barringer concludes from his experience that the results of radium treatment of malignancy of the prostate are superior to removal.

Bumpus, of the Mayo Clinic, has reported 241 cases of carcinoma not treated, with duration of the disease 32 months and the average duration of life after examination 10 months. One hundred and six of his cases were operated, the average duration of the disease being 57 months and the average duration of life after operation 21.67 months.

Of the cases treated with radium, 118 cases died at an average of 12.6 months after treatment; while there were 29 cases who were living an average length of time 28 months.

After six years all untreated patients were dead, while 11 per cent. of the patients treated surgically were living. The radium group has not been observed for so long a period, but at the end of four years 6 per cent. were alive. He concludes that the results from radium are inferior to those obtained by surgery, althugh suggesting that a combination of the two offers a possibility for improvement.

X-RAY TREATMENT

There is no ideal treatment of prostatic malignancy. If the case is inoperable, by far the best treatment that we know is deep x-radiation. This is directed over the bladder and pelvis and causes a wonderful relief of pain and cessation of bleeding. Many of these cases can be carried along with a fair degree of comfort for many months. The longest remission has been two years and nine months. The patient is still living and we feel that much of the success here lies in the fact that the patient lives near at hand and comes in frequently for a small amount of radiation. A few others have come in declaring that they feel so well that they will not take any more treatment. (We have never produced a cure.)

In the cases that are being prepared for operation, the pre-operative x-ray treatment plays a very important part. It lessens the bleeding, if present, and decreases the tenesmus and, by increasing the patient's comfort, adds much to the success of other preparation. At the same time there is a tendency to wall off the growth by fibrotic obliteration of the lymphatics and hinder further extension. The post-operative x-ray treatment should cover the lymphatics of the pelvis and also the bones In all treatment the blood is carefully watched and the treatment is not pushed too far nor too fast. We prefer frequent smaller doses rather than fewer massive doses.

THE SURGICAL MANAGEMENT

If there is definite urinary obstruction, operation is indicated in any case. If there are no metastases and other urinary symptoms are present, operation is advisable because of the possibility of removing all of an early maligant degeneration.

ANALYSIS OF OUR CASES

We have made a study of the 59 cases of carcinoma of the prostate gland which we have seen and treated during the past six years. By means of questionnaires we have endeavored to follow the subsequent history of these cases and have obtained definite and adequate replies from 42 of them.

Table 1

MALIGNANT PROSTATE

	Total No. of Cases	*Heard from*	*Living*	*Dead*
Treatment:	59	42	20	22
Surgical only	23	17	8	9
Surgical and x-ray	19	17	9	8
X-ray only	17	8	3	5

From the information thus secured, we have tabulated the data with a view of determining what influence surgical treatment, x-ray treatment or their combination may have upon the prolongation of the life and the comfort of these cases.

Table 2

DURATION OF LIFE AFTER TREATMENT OF THOSE NOW DEAD

	Total	*Surgery alone*	*Surgery and x-ray*	*X-ray alone*
Number of cases	22	9	8	5
Average duration of life	—	14.1 mos.	19 mos.	12.7 mos.
Lived 0-1 year	9	4	3	2
1-2 years	8	3	3	2
2-3 years	4	2	1	1
3-4 years	1	0	1	0

Table 3

DURATION OF LIFE OF THOSE STILL LIVING

	Total	*Surgery alone*	*Surgery and X-ray*	*X-ray alone*
Number of cases	20	8	9	3
Average duration of life	—	40.4 mos.	20.7 mos.	16 mos.
Living 0-1 year	6	1	3	2
1-2 years	5	3	2	0
2-3 years	2	0	2	0
3-4 years	2	0	1	1
4-5 years	0	0	0	0
Over 5 years	5	4	1	0

CONCLUSIONS

While the number of cases in each group is relatively small, our experience would seem to indicate that a judicious combination of x-ray

both pre- and postoperatively, with the surgical treatment of the patient with a malignant prostate, will not only prolong life but add greatly to the patient's comfort.

THE APPLICATION OF MODERN UROLOGIC DIAGNOSTIC METHODS IN PEDIATRICS, WITH CASE REPORTS*

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In presenting this subject it is our earnest desire to stimulate more interest among urologists in a subject which, upon investigation, appears as practically an undeveloped province of medicine and surgery. In support of the above statement, your attention is directed to the small number of men in this country who have made a study of the subject. Kretschmer, Beer, Hyman, Hinman, Stevens, Thomas and Tanner, and Helmholz have been pioneers in this field, and a close study of their efforts has been a wonderful inspiration and help to me in my work in this field.

A careful urological study of the adult presenting genito-urinary symptoms is now recognized as a necessity by all surgeons who desire to give their patients an intelligent opinion. Such a study may require cystoscopy, ureteral catheterization, functional kidney determinations, cystography and ureteropyelography. There are well known procedures and are considered necessary in arriving at a correct diagnosis in the adult. Are not these same valuable instruments of precision and modern urologic methods both applicable and practical in urologic studies of pediatric cases? Why do children presenting genito-urinary symptoms not receive the same careful urologic studies as do the "grown-ups"?

COÖRDINATION OF EFFORTS OF THE GENERAL PRACTITIONER AND PEDIATRICIAN WITH THOSE OF THE GENITO-URINARY SURGEON

The family physician and the pediatrician first see practically all children presenting urinary symptoms, hence it is evident that we must secure the closest coöperation of the above mentioned to achieve results. In order to create such an alliance it is necessary for the urologist to demonstrate to the general practitioner and pediatrician that the use of the cystoscope and other modern urologic methods of diagnosis are simple, safe, sane, and often necessary to arrive at a diagnosis in children, just as they are now routinely used in adults.

The pathologic conditions of the urinary tract in children differ in no respect from the genito-urinary lesions found in the adult except as age influences the incidence of malignancy in such cases.

INCIDENCE

It is probably true that diseases of the genito-urinary tract are less frequent in children than in adults, but they possibly occur much more frequently than are diagnosed. Drs. Brown and Corbeille,[8] in a study of eighty fetuses and young infants, have shown that sixty-three, if they

*Read by Dr. Lester C. Todd.

had lived, would have started life with impaired renal function. The material upon which their studies were made was not selected but taken at random, and their pathologic findings would indicate that genitourinary diseases exist more frequently in children than they are diagnosed.

SYMPTOMS REQUIRING THOROUGH UROLOGIC INVESTIGATION

Subjective symptoms referable to the urinary tract are difficut to elicit in childhood and much more difficult to interpret. (1) Pus in the urine (from catheterized specimen); (2) enuresis; (3) overdistended bladder; (4) abdominal tumors thought to be of urinary tract origin; (5) localized pain in kidney and bladder region; (6) rarely hematuria. These are some of the common conditions which are frequently encountered in disease of infancy and childhood, and require thorough urologic study.

CYSTOSCOPY IN YOUNG BOYS

Very small instruments are now available for cystoscopy and ureteral catheterization, but for anatomic reasons this work is somewhat limited and difficult in young boys. Meatotomy and internal urethrotomy may be indicated in cases with small meati and abnormally small urethrae. In baby girls little trouble is encountered in carrying out the routine urologic examination.

INDICATIONS AND NECESSITY FOR CYSTOSCOPY IN PEDIATRICS NOT EMPHASIZED

In young children giving evidence of a possible beginning acute otitis media or an acute meningitis, the general practitioner or pediatrician in attendance does not hesitate to advise an anesthetic to the point of analgesia for the purpose of either a thorough examination or incision of the ear drum, or lumbar puncture as a diagnostic or therapeutic measure. The bronchoscope is recognized as a very necessary instrument of precision, and the bronchoscopist's work is not only necessary but outstanding in every community. Removal of a foreign body from the respiratory tract of a year-old child is quite common, while cystoscopy and ureteral catheterization advised on a child of the same age are generally looked upon as of doubtful value and fraught with many dangers. The answer is quite evident. The bronchoscopist has properly presented the value of his work in children to the profession; the urologist has not.

UROLOGIC PROCEDURES ADAPTABLE TO YOUNG CHILDREN

Routine cystoscopic and Roentgen ray examination should be made in children with persistent urinary symptoms, keeping in mind lesions of the upper urinary tract and the presence of calculi that cannot be shown by the Roentgen ray. Cystography is most important in cases of marked pyuria, where it is difficult to clear the bladder fluid in order to use the cystoscope, and Hyman[3] prefers this measure to cystoscopy in children. It is a simple procedure and can be carried out in the very young without anesthesia. In cases of diverticula Hyman[3] recommends contrast cystography. This is carried out by taking a plain cystogram, after which the solution is drained off; air is then injected into the bladder and another plate is taken. In the contrast cystogram the air-filled

bladder stands out in contrast to the diverticula, which still contain the cystographic solution. Pyelograms and ureterograms should not be made unless there is some definite indication, keeping in mind that the child is usually asleep and it is difficult to tell when the ureter and kidney pelvis are completely filled. It has been our experience that, with the use of Todd's[9] pressure gauge, satisfactory pyelograms can be obtained with a minimum amount of danger to the patient and followed by little reaction. In one baby, where the pressure was not controlled, the child had a rather severe reaction which subsided in twenty-four hours. In this connection we have also observed, in our somewhat limited experience, that children seem to stand ureteral catheterization *better than adults.* These cases we report have apparently had little trouble or discomfort except in the one case mentioned above. It has occurred to us that with complete relaxation of the ureter under ether, instrumentation can be done with less irritation to the mucous membrane of the ureter and therefore less ureteral spasm and pain following. Litholapaxy has been successfully practiced in China, India and Russia; and Freyer in England reports 140 litholapaxies in children. Kretschemer[1] reports two cases of vesical stones in children in which he employed the crushing operation.

Case 1. Female, aged 8 years, admitted to our clinic December 1, 1923. *Chief Complaint*: Dribbling of urine. *Family History*: Father died of cancer of liver at age of 39. Mother living and well. *Past Medical History*: was of no significance except that the child had never had a severe illness but has had constant dribbling of urine since birth. *Physical Examination*: Well developed well nourished and healthy-looking child. Lungs clear throughout. Heart regular, No murmurs. Abdomen negative. *Local Examination*: External genitalia negative. On careful examination there is a small opening on the right lateral wall of the urethra from which can be seen intermittent spurts of urine. Its action resembles that of a ureteral opening in every respect except that it is smaller. There is both an intermittent and expulsive muscular action, which causes the urine to spurt intermittently, simulating the appearance of a ureteral opening when seen with the cystoscope in the bladder. *Treatment*: Under cocain anesthesia an ordinary probe was passed gently in this opening and passed far enough upward without meeting resistance to indicate that it had passed beyond the bladder wall. The patient was cystoscoped without difficulty. At the same time a probe was passed up the extra opening, the end of which was back of the bladder wall. A pyelogram was done on her left side with the idea that the pyelographic media might flow through the extra ureter. This did not occur. *Diagnosis*: Anomalous ureter opening on right margin external urinary meatus near position of Skene's duct. An unsuccessful attempt was made to completely obliterate this tract between the external meatus and the bladder by passing a probe through the sinus and ligating the same by separating the superficial vaginal wall. At a later date an effort will be made to isolate the anomalous ureter and remove the same.

Case 2. Female, aged 8 years, admitted to our clinic March 5, 1925. *Chief Complaint*: Pyuria; pain in region of left kidney and loin (unreferred.) *Past Medical History*: The child has always been frail and delicate and has had indefinite gastric symptoms all her life. Tonsils and adenoids removed four years ago. *Present Illness*: Patient suffered with an acute attack of pain in her left

lumbar region about 3 years ago. Pain was referred to back and groin and was accompanied with frequency of urination and fever. Pus was reported in the urine at this time. At intervals patient has had similar attacks, which are accompanied with frequency of urination and temperature. Last attack came on a month ago and was more severe than the others. Temperature ranged from 102° to 103° F. for a week or ten days. Considerable blood reported in the urine at this time. *Examination*: General appearance of the patient is that of a delicate young girl. Nothing remarkable noted on superficial examination. *Genito-Urinary Examination*: External genitalia negative. *Cystoscopy*: No difficulty in passing the cystoscope. Bladder was negative throughout. Both ureters were normal in location and appearance and were catheterized without difficulty. Urine was entirely negative from catheterized bladder specimen and from each kidney individually. The culture of urine from each kidney was negative. *X-ray*: No stone shadows were seen. *Left Pyelogram*: Normal pelvis, no enlargement or dilation. *Laboratory Findings*: Blood—W. B. C. 9,200. R. B. C. 4,300,000. Hb. 85%. Blood Wassermann negative. The patient was ordered to report back on March 12. As the history indicated recurrent pyelitis it was thought advisable to do a uretero-pyelogram, which was done, showing a normal pelvis. *Diagnosis*: Genito-urinary tract negative at the present time. *Treatment*: Observation.

Case 3. Female, aged 6 years, admitted to our clinic July 6, 1925. *Chief Complaint*: Retention of urine since 2 years old. *Family History*: Negative. *Past Medical History*: Ordinary diseases of childhood—no complications. A well girl until two years of age. *Present Illness*: Patient has had intermittent attacks of pain in lower hypogastric region and attacks of fever. During the past six weeks she has lost considerably in weight and for the past two weeks it has been necessary for the family physician to catheterize the patient at intervals. *Cystoscopic Examination*: Marked relaxation of vesical sphincter. No difficulty in passing the cystoscope. The bladder is markedly inflamed (second degree cystitis.) It is quite difficult to distinguish the ureteral openings. The right ureteral opening, which was about three times the normal size, was finally located and catheterized. Could not locate the left ureteral opening. Trigone and vesical neck are smooth and they give the appearance of being "ironed out." *X-ray* 7-10-25. *Cystograms*: (1) The outline of the bladder is rough on both sides but is smooth at the base. There is a very definite displacement of the bladder to the left side and an indentation in the upper right portion of the bladder shadow suggesting the presence of an external mass in the right side of the pelvis. (2) Under greater pressure, filling part of the irregularities of the bladder outline, they are smoothed out; and the left ureter shows a regurgitation to the kidney. The ureter is dilated and shows a sharp kink in its mid-portion. The displacement of the bladder to the left is still pronounced, and the filling defect in the upper right is present. 7-11-25, patient recystoscoped under ether and right pyelogram done. *Right Pyelogram*: Pyelographic medium does not fill kidney pelvis at all but comes back into the ureter, showing that the right ureter is markedly dilated throughout its length. *Cystogram*: Bladder only partially filled, with a rough outline and defect on upper right. *Laboratory Findings*: *Urine*: strongly acid. Definite trace albumin. Glucose negative. *Sediment*: Pus cells numerous (in clumps), bacilli numerous, no casts, no blood. *Urine Sediment Stained for Tubercle Bacilli*: None found. *Culture of Bladder Urine*: Colon predominant, also a short-chained streptococcus. *Blood*: W. B. C. 10,300. R. B. C. 3,100,000. Hb. 4.6 gm. per 100 cc. (28% Sahli scale). *Differential*:

Polys. 51%; Lymph. 46%; L. M. and T. 2%; Eosin. 1%. Some variations in size and shape, no nucleated reds. No malarial parasites found. Wassermann negative. *Spinal Fluid*: pressure not increased. Cells 2. Solids not increased. Wassermann negative in all dosages up to 1 cc. 7-11-25, *Urine from Ureters*: *Right*—S. G. 1.004, pus abundant. Many bacilli and cocci forms. Left - S. G. 1.010, no pus. Epithelium very abundant. A few hyaline and granular casts. *Note*: Patient has been referred to a competent pediatrician and neurologist. We were unable to make a diagnosis. *Diagnosis*: Chronic retention of urine, cause unknown. *Treatment*: Patient returned to family physician, with instructions to empty bladder and irrigate same with boric acid.

Case 4. Female, aged two years, four months, admitted to our clinic, August 31, 1925. *Chief Complaint*: Sudden enlargement of the abdomen. *Family History*: Negative as far as obtainable (illegitimate child). *Birth History*: Normal delivery. Breast-fed baby. *Past Medical History*: Child has never been sick until the present condition developed. *Present Illness*: While bathing the baby on August 26, 1925, noticed that the baby's abdomen was larger than normal. Child complained of no symptoms and apparently had suffered none. Mother states "the child has not been sick a day in its life." Family physician was called in, who advised surgical attention. *Examination*: A well nourished and apparently a normal baby in every respect. On inspection the abdomen was quite distended, more on the right than on the left. There was a large tumor-like mass situated in the right iliac extending up on the right umbilicus. The mass was irregular in outline, slightly movable and apparently attached to the right flank. It could not be definitely determined by palpation whether the tumor was a firm growth or a cyst. Cystoscopy, ureteral catheterization and urography were determined upon. *Cystoscopy*: A small baby Wolfe cystoscope was used. Bladder was normal in every respect. Both ureteral openings were normal in appearance and location. An attempt to catheterize the right ureter with a No. 5 F. radiographic catheter was unsuccessful. A No. 4 F. non-radiographic catheter was substituted and passed to the right kidney pelvis without difficulty. A No. 5 F. radiographic catheter was then passed to the pelvis of the left kidney. The left kidney functioned normally, but only a drop or two of urine could be obtained from the right. *Laboratory Findings. Urine*:- Definite trace albumin; glucose negative. *Sediment*: Pus cells numerous (in clumps), no casts, no blood. *Urine from Ureters*: *Right*—No pus, R. B. C. numerous; *Left*—No pus, blood abundant. *Culture of Bladder Urine*: Abundant growth of a very short Gram-negative bacillus. *Blood*—W. B. C. 24,700. R. B. C. 3,580,000. Hb. 10.55 gm. per 100 cc. (61% Sahli scale). Wassermann negative. *X-Ray*: Increased density in region of mass, especially over lower lumbar vertebrae. Not sharply demonstrated—not satisfactory. Cystogram and barium enema would be of service. Pyelogram of Neo-silvol was made. *Right Ureteropyelogram*: Ureter deflected by tumor mass past midline and to the left. Pelvis of kidney is dilated and rounded in outline with loss of all calyx detail. Opinion varied as to diagnosis in this case. The following diagnoses were considered: (1) Polycystic kidney, (2) Simple cyst of right kidney, (3) Ovarian cyst, (4) Malignant tumor of right kidney. We finally decided the condition was a malignant tumor of the right kidney, probably embryonic in character. This was the final pre-operative diagnosis. At operation a large malignant tumor of right kidney was removed, with the following pathological report: *Pathological Report*: Right kidney tumor removed 9-8-25.

Weight 1127 gm. (20x13x9 cm). *Summary*: There is a large neoplasm of the lower pole of kidney. Kidney itself appears as a thin cap at upper pole. *Microscopically*: The growth is seen to be a typical mixed embryonal tumor of the kidney (Wilm's tumor).

Case 5. Female, aged 18½ months, admitted to our clinic February 21, 1925. *Chief Complaint*: (1) Temperature ranging in afternoon from 102° to 104° F. for the past two months; (2) Pyuria. *Birth History*: Delivered July 31, 1923, at State Hospital, Columbia, S. C., by cesarean section. *Feeding and Development*: Bottle-fed baby. Very hard to get food that would agree with baby. Developed slowly. Baby well until 6 months ago. *Past Medical History*: Baby had pertussis (severe attack) followed by bronchopneumonia. *Present Illness*: About January 1, 1925, mother noticed a very disagreeable odor of urine and had a specimen examined. A diagnosis of pyelitis was made. Baby's temperature went to 102° to 104° F. without an apparent cause. Family physician, feeling that the case did not respond to medical treatment, referred the baby to me for examination. *General Examination*: Patient is quite delicate and anemic looking, is quite fretful and irritable. Tonsils were slightly hypertrophied and almost met in the median line. Pillars and pharynx appeared red. Superficial general examination by me gave the impression that the physical findings were negative. *Local Examination*: External genitalia negative. Baby voided urine quite frequently, and it was difficult to obtain a catheterized specimen. Cystoscope was passed with some difficulty but without trauma (small urethral). Bladder was irritable and hard to cystoscope; second degree cystitis, especially in the region of the trigone. Both ureteral openings appeared red and edematous and pouty. Right could not be catheterized for more than 2 cm. (This was quite unusual, for a No. 4 non-radiographic catheter was used.) I thought there was a spasm of right ureteral opening, although there may have been obstruction. The left gave the same pouting appearance. Was catheterized with a No. 4 F. non-radiographic catheter without difficulty or meeting obstruction. *Laboratory Findings*: *Urine* Acid. Trace albumin. Glucose negative. Sediment: Pus cells numerous (in clumps), no casts, an occasional R. B. C. *Culture of Bladder Urine*: Mixed growth of staphylococcus and a Gram-negative bacillus. *Urine from Ureters*: Right—no pus, an occasional R. B. C., epithelium abundant in various sized flakes. Left—no pus, epithelium in large flakes. *Blood*: Hb. 56% (normal 79%), R. B. C. 3,580,000. W. B. C. 20,700 (Leukocytosis-infection process.) Differential: Polys. 44%; Lymph. 25% (slight lymphocytosis for her age); M. & T.'s 2½%; Eosin. ½%; Baso. 1%. Marked achromia. No poikylocytosis. Normal amount of blood platelets. *X-ray*: Intestinal tract and stomach distended with gas. No stone shadows made out in urinary tract. *Culture of Urine from Left Kidney*: One small colony of a Gram-negative bacillus obtained. *Opinion*: Although there was no pus from either kidney, a diagnosis of acute pyelitis is quite evident. *Treatment*: In spite of no pus in either kidney, a diagnosis of recurrent pyelitis of colon bacillus type was made and the pelvis of both kidneys irrigated, with very gratifying results.

Case 6. Female, aged 2½ years. Admitted to clinic May 9, 1925. *Chief Complaint*: Recurrent attacks of high temperature with pyuria. *Family History*: Negative. *Past Medical History*: Normal delivery. Had never been sick until August 1924, when the child had high temperature followed by a large amount of pus in urine. She had numerous bowel upsets all of the summer of 1924, and

was sent to Saluda, N. C., to be properly fed and to get rid of the colitis. *Present Illness*: For the past two weeks the baby has had temperature of 102° F. with a large amount of pus in the urine. The child has had four similar attacks since August, 1924, temperature varying from 99° to 102° F., and on every occasion the urine contains large quantities of pus. Medical treatment in this case has been notably unsuccessful, and Dr. Wm. L. Simpson brought the child to me for opinion and advice as to pelvic lavage. *Local Examination*: External genitalia nothing remarkable. Cystoscopy under ether anesthesia. Had no difficulty in passing the cystoscope after filling the bladder. The bladder was normal except in the region of the ureteral ridge and surrounding each ureteral opening, where there was definite evidence of bullous cystitis. Both ureteral openings were large and gaping. Had no difficulty in passing No. 5 radiographic catheter to pelvis of each kidney. Many bulli completely surrounded the left ureteral opening, and it appeared that most of the pathology was on that side. *Laboratory Findings: Urine*—Acid. Trace albumin. Glucose negative. *Sediment:* Pus cells fairly numerous (in clumps), bacilli abundant (in clumps) and nonmotile. An occasional small granular cast, no blood, few epithelial cells. *Culture of Bladder Urine*: Gram-negative bacilli in pure abundant growth, B. Coli. *Urine from Ureters*: Right: 2 to 3 W. B. C. to h. p. f., epithelial cells numerous, few R. B. C. Left—2 to 3 W. B. C. to h. p. f., epithelial cells numerous, few R. B. C. *Culture of Urine from Ureters*: 4 to 5 colonies of a Gram-negative bacillus obtained from the right; heavy growth of a gram-negative bacillus from the left. *Blood*: W. B. C. 13,500. *Differential*: Polys. 45%; Lymph. 51%; L. M. & T. 3%; Eosin. 1%. *X-ray*: No stone shadows seen. Left Pyelogram: Normal pelvis, ureter dilated down to bladder wall. *Opinion*: Recurrent bilateral pyelitis—colon bacillus type. *Treatment*: Pelvis of each kidney was lavaged with ½ of 1% silver nitrate solution, with very pleasing results and steady improvement.

Case 7. Female, aged 2 years, admitted to clinic September 18, 1925. *Chief Complaint*: (1) Intermittent attacks of high temperature; (2) Frequency of urination with pyuria. *Family History*: Negative. *Past Medical History*: Has no bearing on the present condition. *Present Illness*: Last July a year ago patient had a severe attack of colitis, but there were no special symptoms directing the attention to the bladder or kidneys until January, 1924. Since January, 1924, the child has had one attack a month, which would be accompanied by high temperature with frequency of urination. Since August, 1924, the mother thinks the attacks have become more frequent but not so severe. Pyuria has resisted all medical treatment. *Examination*: External genetalia nothing remarkable. *Cystoscopy*: Cystoscopic examination unsatisfactory, produced by blurring of the lens of the cystoscope; but both ureters were catheterized without difficulty. *Laboratory Findings*: *Urine*—Acid. Faint trace albumin. Glucose negative. *Sediment*: Pus cells fairly numerous (in clumps), few bacilli, no casts, few R. B. C. *Urine from Ureters*: Right—no pus. R. B. C. fairly numerous. Left—2-4 pus cells to h. p. f., R. B. C. fairly numerous. *Culture of Urine from Ureters*: Right—Pure growth of a Gram-negative bacillus. *Left*—Pure growth of a Gram-negative bacillus. *Blood*: W. B. C. 9,500. R. B. C. 4,480,000. Hb. 73%. *Differential*: Polys. 54%; Lymph. 42%; Eosin. 2%; L. M. and T's 2%. No malarial parasites found. No achromia, no nucleated reds. *X-ray*: Kidneys and bladder negative. Catheters up to kidneys. *Left Pyelogram*: normal filling of

the pelvis. *Opinion*: Pyelitis recurrent, left. *Treatment*: Left kidney pelvis lavaged with mercurochrome with very pleasing results—the child becoming progressively better.

Case 8. Female, aged 13 months, admitted to our clinic May 26, 1925. *Chief Complaint*: High temperature and pyuria. *Family History*: Negative. *Past Medical History*: Normal delivery, breast-fed. Has never had any sickness up until a few days ago when child developed pertussis or an ordinary cold. She has had no injury or operation. *Present Illness*: Two weeks ago child began to have enuresis. Following enuresis the baby's temperature ranged from 101° to 104° F. Temperature has been continuous for two weeks. On 5-23-25 urine was examined by family physician and a large amount of pus was found. *Physical Examination*: On inspection the baby is fairly well nourished, is quite toxic, and from all outward manifestations is an exceedingly sick child. The child is pale, has a "pasty" look, and she lies in a semi-stuporous condition. *Genito-Urinary Examination*: External genitalia negative. Cystoscopy under ether anesthesia, only 4 drams of ether being used. No difficulty in introducing the cystoscope; catheterized both ureters. Bladder is normal and both ureteral openings appear normal. *Laboratory Findings*: Urine faintly acid. Glucose negative. Albumin, definite trace. *Sediment*: Pus cells very numerous (in clumps); a very occasional R. B. C.; few bacilli; no casts found. *Culture of Bladder Urine*: Heavy growth of a gram-negative bacillus. *Blood*: W. B. C. 31,000. *Differential*: Polys. 66%; Lymphs. 22%; M. and T's 12%. *Differential Specific Gravity*: *Right*—1.005, 1 to 3 pus cells to h. p. f., an occasional R. B. C. *Left*—1.004, 1 to 4 pus cells to h. p. f., an occasional R. B. C. Left *Ureteropyelogram*: Normal ureter and kidney pelvis. Gastro-intestinal gas obscures. *Opinion*: Acute bilateral pyelonephritis. *Treatment*: Each kidney pelvis was irrigated with 2% solution of mercurochrome. In 48 hours temperature fell to normal, and the child made a continuous and successful recovery.

Case 9. Female, aged 3 years, admitted to clinic August 24, 1925. *Chief Complaint*: Intermittent attacks of high temperature with pyuria. *Family History*: Negative. *Past Medical History*: Recurrent attacks of tonsillitis; tonsils removed three weeks ago. *Physical Examination*: A very well developed but anemic looking girl. *Local Examination*: External genitalia negative. *Cystoscopy*: no difficulty in passing the cystoscope. Second degree cystitis in the region of the trigone. Ureteral openings normal in location and appearance. Both ureters catheterized to the kidney pelvis without difficulty. *Laboratory Findings*: *Urine*—Acid. Definite trace albumin. Glucose negative. *Sediment*: Pus cells numerous (in clumps), no casts, no blood. *Urine from Ureters*: *Right*—S. G. 1.005. No pus. *Left*—S. G. 1.005, no pus. *X-ray*: Kidneys and bladder negative. *Opinion*: Recurrent attacks of pyelitis of the colon bacillus type. (Period of remission at the present time.) Pediatrician, Dr. John R. Ashe, was called in to see patient for physical examination. *Treatment*: Advised observation.

Case 10. Female, aged 6 years, admitted to clinic August 31, 1925. *Chief Complaint*: Recurrent attacks of colicky pains in right iliac region; referred to region of bladder and genitalia. These attacks of colic were accompanied with frequency of urination and hematuria. A diagnosis of ureteral calculus, right (lower third) has been made by Dr. George R. Livermore, Memphis, Tenn. The

stone has been manipulated by him. *X-ray*: Stone lower end of left ureter back of bladder wall. The child is in good condition and the stone is producing no symptoms. Cystoscopy and cystoscopic manipulation of the stone was not advised.

CONCLUSIONS

1. The applicability of modern urologic methods of diagnosis and treatment to young children is not generally appreciated.
2. Urologists should strive to create a wide-spread interest in this subject among general practitioners and pediatricians.
3. The urologic problems of diagnosis and treatment differ little in child and adult.
4. There are no contra-indications to modern urologic diagnosis and treatment in young children except as instrumentation is contra-indicated on account of anatomic differences.
5. With a closer coöperation between general practitioner, pediatrician and urologist, and with widespread interest created in the subject, more children will receive thorough urologic studies and proper treatment.

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DISCUSSION

Dr. W. M. Coppridge, Durham: The importance of complete urological study in children is becoming more and more apparent. Urologists certainly find a good many lesions that a few years ago they did not think existed or thought were very rare. I think one of the most important things in connection with this subject is the finding of congenital lesions of the urinary tract—congenital obstructions of various kinds, where there is chronic retention of urine and perhaps hydronephrosis. I reported in the section on pediatrics, this morning, the case of a boy of ten years of age who died of what appeared to be chronic nephritis—certainly renal insufficiency. Upon autopsy we found a constriction of the neck of the bladder through which we could not pass the smallest filiform. The child for several years had complained of symptoms of chronic Bright's disease and died of uremia. On autopsy we found a very much enlarged bladder and complete destruction of both kidneys by hydronephrosis. I saw a case last year that we were not able to study very much, but which was of great interest to me; a child two months old who came to the hospital one evening and died during the night. Dr. Booker saw the case. The symptoms were those of an acute abdomen. A definite diagnosis, I believe, was not made. On postmortem a pus kidney was found, with a considerable amount of hydronephrosis. The child was two

months old, and it would seem that this was a case of congenital obstruction of the ureter, resulting in renal obstruction and infection. Hinman and Kutzmann have recently collected fifty cases of congenital valvular obstruction in the posterior urethra, and add to this six cases of their own. It would seem that this condition is much more common than was formerly supposed.

CERVICITIS, ENDOCERVICITIS, AND LEUKORRHEA

Robert Thrift Ferguson, M.D., F.A.C.S., Charlotte.

In presenting this subject I shall not attempt to bring you anything particularly new but to outline and emphasize some of the outstanding principles and facts necessary to the accomplishment of a cure of these conditions.

A normal woman immediately becomes abnormal with the development of leukorrhea, whether it be a simple affair, an infectious process, or due to the development of some malignant condition. Unfortunately, these cases do not apply to a physician for relief upon the first signs of trouble but wait for further developments; in the meantime they keep their ears to the ground when such matters are under discussion in their little groups and use the local means as gathered from gossip around the fireside of a friend, and when they finally apply to us for relief the condition is usually in an advanced stage.

Cervicitis and endocervicitis will be discussed together, as they rarely occur separately for any considerable length of time and certainly are twins by the time they apply to the gynecologist for relief. Nonspecific infections of the cervix and its mucous membrane are generally the aftermath of lacerations and operative interventions that result in erosion or ectropion or both. Erosion of the cervix is sometimes seen in virgins and accounts for the persistent leukorrhea from which they ofttimes suffer. The cause of this is not definitely known; the chances are, however, that it is due to some mechanical irritation, for the condition is most often seen where there is a malposition of the cervix so that it impinges on the anterior vaginal wall, or where the cervix is unusually long and produces friction against the posterior vaginal wall. Under certain conditions the secretion from the cervical glands becomes acid. This of itself may cause a mild erosion and is frequently the cause of sterility, for the alkalinity of the cervical secretion is absolutely essential for the passage of the spermatozoon into the uterine cavity. There are certain inflammatory conditions in the pelvis which will produce a simple but distressing leukorrhea, chief of which, in my experience, are malpositions of the uterus and diseased adnexa. The common causes of cervicitis and endocervicitis are the staphylococcus, streptococcus, and gonococcus. I have been surprised at the increasingly large number of bad leukorrheas in virgins, and supposed virgins, that are due to either a staphylococcus or streptococcus infection, or to the two combined, which is the most common form seen outside of the Neisserian.

Infections in the female, like those in the male, are more readily cured when tackled in the early stages. Neisserian infection is the most common cause of bad leukorrheas, and this is increasingly common in both married and unmarried women. If the effects of these inflammatory

conditions were limited to the vagina, cervix, urethra, Skene's and Bartholin's glands the prognosis and treatment would be greatly simplified. The gonococcus will nearly always find its way into the adnexa, and this produces either a temporary or permanent crippling of the functions of these organs. The staphylococcus and streptococcus will sometimes do the same thing, especially postpartum. As a rule, however, they are not so inquisitive as their cousin the gonococcus and are satisfied to remain *in statu quo;* but when it comes to the ultimate ambition of the three we might say *omnibus hoc vitium est.* We are all familiar with the havoc that is wrought in the pelvis by extension of these infections. Therefore a little education to direct the public in prevention, then early reporting for treatment, would be a forward step in preserving the pelvis for its normal functions.

I wish to call your attention to some salient features in the treatment of these conditions. The first and most important is that few cases can be cured, even the simple ones, under from two to six months, and many cases require treatment for a much longer time than this. We cannot dismiss these cases with a simple douche and expect them to be cured. We see many cases that have been advised to take douches three times a day over long periods, using either salt water, boric acid, soda, plain water, bichlorid, lysol, creolin, permanganate of potash, and all the known and unknown proprietary and patent remedies on the market; and the simple cases that would be relieved by a few douches are continued *ad infinitum* by the irritation produced by any foreign substance used in the vaginal canal over a continued period of time. If you doubt this, take a case without a leukorrhea and put her on a plain or salt water douche daily over a long period and watch the result. I have cured a great many more simple leukorrheas by discontinuing the douche they were already taking than I have ever done by advising its continuance or giving another in its place. The patient will stand aghast when you tell her to quit all douches and return to your office in ten days to two weeks, but she will be enthusiastic over the result at her next visit. It is a very common occurrence for a patient to come to your office and tell you that she has been taking douches three times a day for a year or longer. Of course, you must have made the necessary examinations to satisfy yourself that it is really a simple leukorrhea and not an infectious one.

There is only one way to get at the etiology of any case of cervicitis, endocervicitis, or the concomitant leukorrhea; and that is by the use of smears and cultures. These must often be repeated several times under varying conditions in many intractable cases. It is exceedingly hard to demonstrate the gonococcus in any case of more than a year's standing, but the history in most of these cases is sufficient and the treatment practically the same. I do not depend on smears or cultures alone but absolutely on both.

An interesting study in these cases, especially the Neisserian infections, is the tubal patency test discovered by Rubin[1] and modified and simplified by the writer.[2] Many of these cases in the early stages will show non-patent tubes, and when the patient is cured patency is reestablished. Every now and then some writer inveighs against this test, saying that it is unscientific, unnecessary and dangerous, when in fact

there is practically no danger. In several hundred cases done in my office, and a large number reported by other men who have used my apparatus, there has not been a single untoward result reported. I sometimes feel that men occasionally write about subjects with which they are not wholly familiar and about apparatus which they have not used or have used unwittingly. This test has been worth more to me in my pelvic diagnoses than any other one thing I have ever used. There are many cases that come complaining of indefinite pelvic symptoms and in which a physical examination reveals nothing, whereas this test will disclose a pair of non-patent tubes which are adherent and which could not possibly be diagnosed by any other known means. I wish to state quite frankly that there are many cases in which I cannot palpate the fallopian tubes, the opinions of other gynecologists to the contrary notwithstanding. In a large number of operations for plastics on the tubes where this instrument said they were non-patent, I have yet to see the first case which was not correctly interpreted. I have become very enthusiastic over its use; since it tells so much, causes the patient practically no discomfort, and is in no way dangerous.

In taking up the treatment of these conditions I wish to state that the use of douches alone is always very unsatisfactory, usually prolonged, and often results in failure to accomplish the desired end. The treatment is necessarily varied to meet the conditions which confront you in a given case, as to whether it is a simple leukorrhea or an infectious one, one that occurs on a virgin field or one that occurs on a lacerated cervix. I shall discuss here only the remedies that I am using at present and have found satisfactory and shall not tire you with a description of numerous remedies with which you are all familiar and which might give equal results in your hands.

The simple cases are treated with local applications and astringent douches and are quickly relieved. The infectious cases are treated with stronger local applications and more astringent douches until the trouble is localized in the glands of the cervix and other neighboring glands, when use is made of the electric cautery to destroy the glandular tissues. This latter instrument is the most valuable means of eradicating the trouble that I have ever seen, when used at the proper stage. In the cases that occur on old lacerations, in addition to the foregoing treatment, operation under general anesthesia must be the final resort to make a finished job and restore the cervix to its normal condition. The choice of operative procedure will have to depend on the individual case. You will be called on to do either a Sturmdorf or a Schröder or some modification of these, to get rid of the infected glandular and scar tissue. The complete cure depends entirely on ridding the field of all the infected tissue either by use of the cautery or operation or both. In this way only is it possible to get results, and unless one is willing to spend much time and give his personal attention to each case and not leave it in the hands of an office assistant he may not expect to get relief from symptoms.

The preparations I prefer to use locally are the various silver salts, preferably argyrol in 25 per cent. solution and protargol 20 to 30 per cent., and mercurochrome one per cent. in equal parts of lanolin and vaselin. It is remarkable what can be accomplished with the electric cautery

in your office, without the aid of an anesthetic and with very little discomfort to your patient. For the astringent douches I prefer a freshly prepared solution of Condy's fluid and normal salt or boric acid solution for the cleansing douches. One of the main considerations in the treatment of these cases is cleanliness before your treatments, cleanliness following your treatments, and having a perfectly dry surface upon which to make your local applications. The result of your treatment will depend largely upon this latter condition, which is accomplished by the use of a large rubber bulb. All of my patients are instructed to use small pledgets of absorbent cotton in the mouth of the vagina, separating slightly the labia, to take care of the secretions and to take the place of the napkin, which is very irritating when worn for any length of time. Another advantage of the cotton pledget is that it can be changed frequently and the patient is not aware of its presence. This will also prevent a vulvitis, which frequently occurs where the discharge is rubbed into the tissues from wearing the ordinary napkin.

Operations on the cervix are very unsatisfactory until you have gotten rid of the infection. After this you may expect and will get perfect union of the surfaces.

There is no more grateful patient than the one whom you have relieved of a distressing leukorrhea, for this symptom plays on the mind like a harp with a thousand strings and all of them out of tune.

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[2]Ferguson. Apparatus for Testing Patency of Fallopian Tubes, Surg., Gyn. & Obs., 39:831, Dec., 1924. Jour. A. M. A., Vol. 84, No. 5, Jan. 31, 1925. Testing Patency of Fallopian Tubes. Sou. Med. & Surgery, Charlotte, April, 1925. Detailed Description Ferguson Tubal Patency Test.

SURGERY OF FASCIA AND MUSCLE IN THE CURE OF HERNIA.

(Based on Clinical and Experimental Evidence)

T. C. Bost, M.D., F.A.C.S., Charlotte.

In a consideration of the various operations with their many modifications for the cure of inguinal hernia, it is agreed that the fundamental principles involved are: (1) high ligation of the sac; (2) adequate reinforcement of the defective abdominal wall; (3) primary healing of the wound. It is a well known fact that a large percentage of the ordinary hernias can be cured without paying any special attention to the method of suturing the different structures; but for the unusual and difficult cases, including all direct hernias, special methods and technic must be employed to secure the maximum number of cures. It is the purpose of this paper to deal primarily with the defective abdominal wall from a repair standpoint, as applied to difficult cases.

It would appear that all of the coverings, and perhaps the adjoining tissues, play a more or less important part in the development of a hernia and also its cure. Even the elastic peritoneum has some supportive strength, though a simple dimpling of this structure predisposes to hernia. In repair, fascia and muscle play the most important parts, in the order named. This being the case, probably 80 to 90 per cent. of the

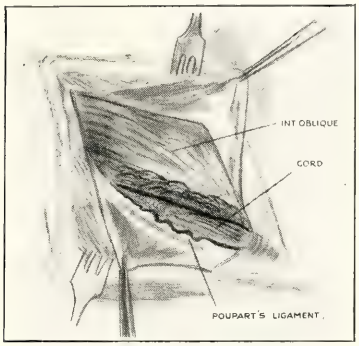

FIGURE 1. PARTS TRAUMATIZED AND READY FOR SUTURING.

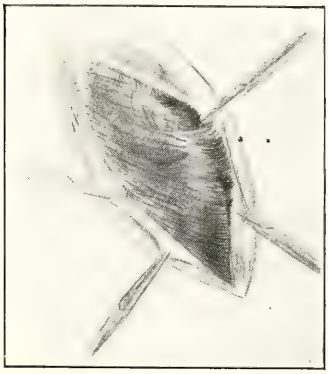

FIGURE 2. UNION BETWEEN INTERNAL OBLIQUE MUSCLE AND POUPART'S LIGAMENT.

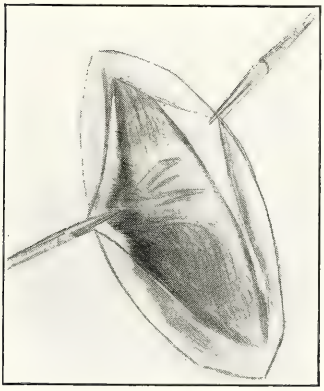

FIGURE 3. UNION BETWEEEN RECTUS MUSCLE AND POUPART'S LIGAMENT.

operations for the cure of inguinal hernia include suturing the internal oblique and transversalis muscles, with their conjoined tendon, and in some instances the rectus muscle and its sheath, to Poupart's ligament either anterior or posterior to the cord. That is to say, nearly all of these operations involve the suturing of muscle to fascia.

The comparatively recent experimental work of Seelig and Chouke might tend to show that suturing of the internal oblique and transversalis muscles, with their conjoined tendon, to Poupart's ligament is futile and useless. Basing their conclusions on the results of suturing the muscles of the thigh of the dog to a fold of fascia lata (structures somewhat analogous to those used in the repair of inguinal hernia), they concluded that normal muscle would not unite with fascia. Previous to this report I had been conducting some experimental work, using the structures in the inguinal region of the dog, instead of the thigh, to determine the effect of trauma on the union of fascia as it is usually sutured in an inguinal hernia operation. The experimental work consisted of dissecting out the two inguinal regions of a dog. On one side the parts (viz, muscle and fascia) were curetted and in some instances narrow strips of muscle cut away to give a fresh surface (Fig. 1) and then sutured, bringing the raw surface of the ligament and the fibrous components of the muscle into more active contact. The other side was simply sutured without curetting and with as little trauma as possible, to be used as a control. Ten dogs were operated on in this series. Catgut and silk were used as suture material. Local and general anesthetics were used. At the end of periods varying from one to six months the animals were anesthetized and killed, and the fields of operation were studied. In a comparison of the two sides it was found that in every instance there was very feeble and weak fibrous union between the muscle and fascia where simple suturing had been done; while on the side which had been curetted or otherwise traumatised it was found that the union was much denser in each instance. In some instances, in separating the muscle from the fascia, bits of muscle remained attached to the fascia and came away with it in the dissection, it being so firmly attached. The density of union varied directly as to the extent of the trauma and the time elapsing between the operation and the investigation. Figure 2 shows type of union between Poupart's ligament and internal oblique muscle. Figure 3 shows rectus muscle, which was freed of its sheath and brought over and sutured to Poupart's ligament under tension, well united (specimens exhibited at meeting). There was no difference in the type of union when local anesthesia was used. This is of importance, as a large percentage of hernias are now operated on under local anesthesia. Catgut and silk seemed to be equally satisfactory suture materials.

Koontz has recently repeated the experimental work of Seelig and Chouke in the thigh of a dog and found that there is normally a layer of areolar tissue between the fascia lata and the underlying muscles. By simply suturing the fascia to muscle Koontz found the result to be the same as that described by Seelig and Chouke, but when the layer of areolar tissue was removed from the fascia and then sutured the muscle became firmly adherent to the fascia.

It is a well known fact that in the repair of muscle wounds the muscle fibers play little or no part, but the repair is effected by a connective tissue stroma which forms a firm scar. Microscopically the scar is held in close and firm contact by innumerable ramifications of the connective tissue stroma among the muscle fibers, thus making it insseparable from the muscle.

In operating for recurrence where muscle had presumably been sutured to Poupart's ligament I have observed the muscle attached to the fascia at its upper angle, while the hernia had developed along the lower part of the ligament. Mathews and others have called attention to this. Coley says that in his operations for recurrence he finds muscle united to Poupart's ligament nearly down to the pubic bone. On the other hand it is claimed by Seelig and others that, in their operations for recurrent hernia, Poupart's ligament is generally found smooth and glistening and entirely free from muscle attachments. All surgeons on opening abdomens where a previous section had been done can recall instances where fascia and muscle were densely adherent, with possibly extensive fibrous tissue formation. So, clinically and experimentally, fascia and muscle do unite; moreover, this experimental work shows that much denser union takes place after trauma. It has been known for a number of years that in cases of non-union in fractures irritation or trauma to the fragments, by rubbing the ends together, curetting, drilling holes, etc., increases the throwing out of callus formation and thus causes union to take place. We are all familiar with curetting or irritating chronic ulcers so as to stimulate the formation of granulation tissue to promote healing, and in the peritoneal cavity it is time-honored and common knowledge that irritating two layers of peritoneum causes the parts to become densely adherent. Irritation resulting from wearing a truss over a long period is thought to be a factor in producing adhesions which occasionally result in a cure. This principle of irritation, however, so far as I know has never been applied to the tissues when operating for the cure of hernia, where success depends solely on the density of tissue union.

It was my good fortune during the war to work for two years in the hernia wards along with my other work at the Dortford War Hospital, England, where I had the opportunity of operating on a large number of hernias, including many recurrent cases; and I have operated on a fair number since the war. In practically all cases muscle and fascia have both been utilized. In nearly all of the large hernias the muscle and fascia were curetted about the suture line. Figure 1 shows traumatized parts ready for suturing. In the recurrent cases, which had been operated on from one to three times, the parts were not only curetted, but frequently bits of muscle tissue itself were snipped off with scissors to insure fresh muscle, so as to encourage denser union. The ultimate result of most of the army cases is not known, but no recurrence from either group has come to my attention.

CONCLUSIONS

1. Muscle and fascia, when freed from areolar tissue and brought into direct contact and sutured, unite.

2. Much denser union takes place between muscle and fascia when the parts are traumatized, as with the use of a curette or snipping away bits of muscle tissue.

3. The ultimate results in hernia operations depend upon the density of union of the supporting tissues.

4. If this principle of irritation were applied in operating for hernia, denser and firmer union would result, thereby offering a greater barrier to recurrence and lowering the percentage of failures.

DISCUSSION

Dr. Oren Moore, Charlotte: I do not see any special reason why I should prolong the agony of the afternoon by discussing this paper, since the society did not question the veracity of Dr. Bost as to whether he did or did not perform these experiments. That is the point on which I was to testify, as I saw the experiments and saw the results. It is a well known fact that he has gone through scar tissue, as he explained there, and saw that union had occurred. In a recent operation I did for a recurrence, after an operation many years ago by Dr. Crowell (which he denies having performed), I found that the conjoined tendon had become so adherent to Poupart's ligament that the ligament had split and there was a hernia on each side. It is a well known fact that in abdominal perforating wounds you can see the dimpling many years later caused by the pulling in of the inguinal muscle, causing many times an unsightly and sometimes a very painful scar to the patient.

Dr. J. Shelton Horsley, Richmond, Va.: I think Dr. Bost's work is very admirable, and his conclusions have been justified both by the experimental and clinical work. I was very much interested in Seelig's first report, because it was so at variance with my own experience. I have not had the experience of dissecting out hernias that Dr. Crowell had done so skilfully, but I have had to do some of my own; and I found part adhered to Poupart's ligament and incomplete adherence at other points. Some of the Boston workers have shown that there is firmer union in repair of hernias if the areolar tissue over the fascia and muscles and Poupart's ligament is first removed. This probably explains Seelig's report, but I think Dr. Bost's paper explains the whole question. There is a very small number of cases in which we do not want quite such gentle surgery as we have elsewhere. Dr. Bost's paper also clears up for the first time some of my own experience in hernia, which has been largely empirical, but now I have an explanation for it. I tried plain and chromic catgut in the repair of hernia and found that I had a good many recurrences. I then used kangaroo tendon and have had very much better results. I believe that this is due to the prolonged irritation of the kangaroo tendon, which promotes firmer union.

Dr. Hubert A. Royster, Raleigh: Some of us who recall the old Macewen operation for hernia remember that it depended upon twisting and traumatizing the sac and leaving it in after it was tied and then traumatizing the muscle to produce a good deal of scar tissue. But Dr. John Ashhurst exploded the bubble when he asked, since when has it become the truth that scar tissue is stronger than normal tissue? It is not. We know the most yielding thing in the world is a scar. But what we get

here is not a cicatrix but an actual healing by first intention, and I think that is the true element involved. I noticed in Dr. Bost's experiments there was a fusion and union going in from the muscles to the fascia. So I think we must not look upon it as a scar and, therefore, stronger than the normal tissue, because it is not. I was also very much interested in Dr. Bost's perfect description and analogy in securing union in ununited fractures by irritating the ends of the bones. A fracture will unite much quicker if there is all the time slight motion between the ends of the bones. I think it was the French surgeons who first called our attention to that. Dr. Bost's conclusions are excellent, I think, and have certainly coincided with my clinical experience. Seelig apparently showed the reverse by his experiments, but two or three other men rather disproved his conclusions. It might be well to sound a note of warning that there must not be too much chemical or mechanical irritation, else there might be suppuration.

Dr. Bost (closing the discussion): The question Dr. Royster brought out is, I think, very timely. It is possible to conceive of overstimulation or excessive trauma as Dr. Royster points out, possibly resulting in weakness, but this could only occur where the parts were widely separated, allowing the gap to fill in with scar tissue. However, this could not take place where parts are brought together and securely sutured, thus obliterating space. The question of trauma lowering the local resistance to infection is also a point I have kept in mind, but I have had no infections in my clinical cases so treated, nor did I have any infection in the ten dogs.

When muscle unites to fascia it is not a result of a proliferation of muscle cells or of fascia but a formation of fibrous tissue. In a like manner, when fascia is united to fascia it is through intervening scar tissue; and when muscle is united to muscle it is not a union of muscle fibers direct to muscle fibers but of strands of fibrous tissue ramifying among the muscle fibers, which form a scar holding the muscle together. Furthermore, this experimental work shows that judicious irritation of tissues causes a proliferation of fibrous tissue, thus forming a denser union.

JAUNDICE.

D. B. Cobb, M.D., Goldsboro

To consider the subject of jaundice in a broad sense, to deal with the newer ideas of jaundice as they bear upon that of the obstructive type, and to evaluate the more recent laboratory tests as they may be applied to these surgical conditions, is the object of this paper.

Recently much excellent work has been done concerning the formation of bile pigment. A test has been devised for the qualitative and quantitative detection of bilirubin. We have a better understanding of the structure of the liver lobule. Advances have been made in perfecting a test to study the functional capacity of the liver, and our ideas concerning jaundice have changed.

It was McNee who gave a new direction to our views upon the production of jaundice and who first pointed out that it was probably the reticulo-endothelial system that elaborates the bile pigment. Aschoff first described this system and applied its name. This reticulo-endothe-

lial system is composed of the endothelial cells of the liver, the spleen, bone marrow, lymph nodes, lymph and blood vessels, and serous cavities. It can be demonstrated through the entire animal series, although the distribution and arrangement in the different animals is quite varied.

We have no proof that there are sources of bile pigment formation other than hemoglobin. Experimental evidence points to the physiological phagocytosis of the red blood cells by this reticulo-endothelial system and the elaboration of their product into iron and iron-free pigments. That bile pigment can be formed outside of and independently of the liver cells, there is ample experimental evidence. Mann has produced jaundice in dogs that had had complete removal of the liver. In his experiments the bile pigment formed anhepatically in such large quantities as to account for the natural daily output. It would seem that the formation of bilirubin in man is largely due to the endothelial cells lining the sinuses of the spleen, those contained in the bone marrow and the endothelial cells of Kupffer, which lie along the venous capillaries of the liver. Bile pigment formation has never been demonstrated in the polygonal cells of the liver. Only in the further course of toxic formation of bile pigment or in obstruction to its normal flow do changes in these cells occur. The metabolism of bilirubin must be regarded as being anhepatic in so far as the polygonal cells of the liver are concerned. These act in the capacity of its secretory organ, just as the kidneys are the chief secretors of urea formed elsewhere in the body. Regarding the formation and secretion of bilirubin in this light, jaundice may be classified as follows:

1. Hemolytic jaundice. Here there is excessive blood destruction. Bilirubin is formed in excess, and the polygonal cells are incapable of its secretion. It is both secreted and retained in the blood.

2. Toxic and infective hepatic jaundice. Here the rate of formation of bilirubin is normal, but jaundice results from inefficiency of the polygonal cells of the liver.

3. Obstructive jaundice. Here bilirubin is formed in normal amounts. The liver cells are capable of its secretion, but there is a blockage either in the smaller bile passages within the liver or in the larger extrahepatic ducts; and the bilirubin, after being secreted, is reabsorbed.

More than one of these conditions may be present in the same individual.

Van den Bergh Test. The test for the detection of bilirubin was devised by van den Bergh and bears his name. It has made possible much of the investigation that has been carried on concerning the metabolism of bile pigment. By its use the clinical course of jaundice can be more accurately followed and different forms of icterus demonstrated. The simplicity of the test recommends it for general use. To the blood serum or plasma is added Ehrlich's diazo-reagent. The immediate development of a violet tint is termed the "direct" reaction. The precipitation of the proteins by the addition of alcohol and the development of a definite rose-pink color in the supernatant fluid is termed the "indirect" reaction.

The quantitative measurement of serum bilirubin is made by comparison with an inorganic standard, the color of which corresponds to a 1 to 200,000 solution of azobilirubin.

As to the significance of the direct and the indirect reactions there is a difference of opinion. Just how much reliance can be placed in it as a means of differentiating the different forms of clinical jaundice has not as yet been definitely determined. The two forms of bilirubin that give the direct and the indirect reactions are chemically very nearly related. The indirect reaction is thought to be produced by the bilirubin that is circulating in the blood before it has passed through the polygonal cells of the liver, as in hemolytic icterus. The direct reaction is said to be the result of bilirubin that has passed through the polygonal cells and, owing to an obstruction in the finer bile capillaries or in the large ducts, has been reabsorbed into the general circulation. As an explanation for this McNee suggests the possibility that the bilirubin has been changed, in so far as its reaction to the van den Bergh test is concerned, by its passage through the polygonal cells of the liver.

Aschoff is inclined to agree with McNee in this view, but substantiating proof is not available. As a practical means of distinguishing between the different clinical forms of jaundice the direct and indirect reactions are of limited value. In the cases of frank hemolytic icterus the indirect reaction obtains. The direct reaction is always present in the cases of definite obstructive jaundice. In that large group of cases that usually presents the greatest difficulty in diagnosis, where jaundice is probably due to failure of the liver cells to secrete bilirubin, wholly or in part, these laboratory findings are of doubtful value. Here the reaction may be direct, indirect or a mixture of the two. It is the quantitative determination of bilirubin that is of especial value in cases of obstructive jaundice.

Jaundice is a symptom of a condition, though it is frequently erroneously used as a specific diagnosis. In truth it denotes an abnormality in the metabolism of bile constituents. By complete icterus is meant that condition in which all bile constituents are circulating in the blood in abnormal amounts; a true cholemia. After temporary obstruction of the bile passages, as in biliary colic, cholemia results—all of the bile constituents are retained in abnormal amounts. Bilirubin and the bile acids have different elimination points. Bilirubin must attain a concentration of from 1.5 to 2 mg. per 100 c.c. in the blood before it is excreted through the kidneys. The bile acids immediately pass through the kidneys as soon as they appear in the blood. The pruritis, bradycardia, and decreased surface tension of the urine that frequently follow biliary colic are signs that the secretion of bile acids has been disturbed. The absence of discoloration of the skin, sclera, and mucous membranes following a biliary colic is not evidence that bilirubin has not been retained. Its retention has not been sufficiently great to produce this discoloration, but by means of the van den Bergh test it frequently can be demonstrated in the blood in abnormal amounts. By hyperbilirubinemia is meant an abnormal increase in the serum bilirubin. This prevails in the condition of excessive blood destruction without efficient elimination of the by-products, as in cases of hemolytic icterus. Although cholemia

is the true condition that follows obstruction to the outflow of the bile, we have at present no satisfactory means of determining for clinical purposes the presence of bile constituents other than bilirubin. Thus we are forced to rely upon the determination of the degree of bilirubinemia as the best index to the degree of existing cholemia. It is with this idea in mind that a knowledge of the bilirubin content is of value in cases of obstruction jaundice.

Normally the blood serum contains .5 to 1 mg. of bilirubin per 100 c.c. The threshold of elimination of bilirubin is 1.5 to 2 mg. per 100 c.c. At about this point it is excreted by the kidneys and colors the skin, mucous membranes, and sclera. Takats, in a study of bilirubinemia following biliary colic, concludes that for the development of scleral icterus not only is a hyperbilirubinemia necessary but that, too, it must be of a certain duration.

That the serum bilirubin determinations are of a definite value is without question. Terms such as subicteric and incipient jaundice need no longer be used. As to the intensity of jaundice, its progression and regression, the inspection of the skin is not an accurate method of determination. The character of the illumination and the uncertainty of memory from time to time add to the inaccuray. In dark-skinned races even the sclera are usually misleading. But with the van den Bergh test we have a method of definitely determining the amount of retained bilirubin; the presence of latent icterus can be established; and the degree of frank icterus can be learned with certainty, and its progress, both preoperatively and postoperatively, can be accurately followed.

Liver Function Test. A means of determining hepatic function would aid greatly in the diagnosis of suspected liver disease, and in those cases where an operative procedure might be indicated it would add materially in deciding for or against the advisability of surgery. But the liver does not lend itself readily to functional study. It receives its blood supply from two entirely different sources, the hepatic artery and the portal vein; and the products of its activity are discharged in different directions, into the blood and into the bile. It is an organ of multiple functions, and our knowledge of its physiology is as yet inadequate. Numerous tests have been devised to study its efficiency. Probably by no single test will it be possible to determine the sum total of all of its activities.

At present the use of phenoltetrachlorphthalein seems to be of most value. This dye, after intravenous injection, is taken up from the blood stream largely by the liver and secreted in the bile. Its first application to clinical medicine was made by Rountree, Horwitz and Bloomfield. The earlier methods consisted of attempts to determine the amount of this dye that was excreted in the feces. The laboriousness of the procedure and the inconvenience it caused the patient necessarily excluded it from use. The next means was to collect the bile by means of the duodenal tube and thus determine the time of the first appearance of the dye, the time of its maximal appearance, and the total quantity secreted. This method had many disadvantages, as the diffi-

culty of properly placing the end of the tube, the uncertainty of the flow of the liver bile, the possibility of loss of bile, and the probability of admixture with duodenal contents.

The method most often used was first carried out by Rosenthal. Solutions of phenoltetrachlorphthalein may be obtained in ampules. One cc. of this dye is injected intravenously for each 22 pounds of body weight; and at the end of 15 minutes, 1 hour, and two hours samples of the blood are taken. To the clear serum is added a few drops of 10 per cent. sodium hydroxide to bring out the color of the dye, and comparison is made with standard tubes. Thus is determined the amount of dye remaining in the blood stream that has not been secreted in the bile by the liver. In normal individuals the dye is rapidly removed from the blood stream, only 5 to 7 per cent. remaining at the end of 15 minutes and at the end of an hour usually less than three per cent. In cases of cirrhosis of the liver and in the conditions of toxic and infective hepatitis there is an increased retention of the dye. The results in these conditions would depend primarily upon the secretory capacity of the liver cells. Cholecystitis does not produce any striking abnormality in the results of the test. Only when that condition is associated with more or less diffuse liver involvement, as hepatitis, would retention of the dye be found. In malignant growths the results depend upon the extent of invasion of the liver substance and the degree of blockage produced. Rosenthal, in experiments on rabbits to determine the relation of impaired function to the amount of normal liver tissue, found that increased retention of the dye was first detected after 12 per cent. of the total liver substance had been removed. When greater amounts were removed the degree of functional impairment maintained a constant relation to the quantity of liver tissue. Regarding such experimental removal of the liver tissue in the same light as replacement by malignant invasion, it is readily seen that a degree of dye retention sufficient to be of diagnostic aid would result only when the growth was very extensive or when its location was such as to cause an obstruction to some of the larger bile ducts.

In experimental work done by Bollman and Mann and by Snell, Greene and Rountree, in which the common duct was ligated in cholecystectomized dogs, there was a marked retention of the dye, amounting to 30 per cent. or over within 24 hours. There also resulted marked retention of the serum bilirubin. After the obstruction was removed there continued to be a slight retention of phenoltetrachlorphthalein. This was thought to be due to an alteration in the secretory ability of the polygonal cells of the liver, which was the result of retained bile. From this it would seem that in cases of obstructive jaundice the degree of dye retention would be proportionate to the degree of jaundice and would show a definite relation to the length of time the jaundice had been present.

The phenoltetrachlorphthalein test gives a fairly accurate index to the degree of retained bile, but the existence of an obstruction in the duct so results in a retention of the dye as to make the test of very limited value in estimating the degree of actual liver damage. In the cases without clinical evidence of jaundice and with only a slight de-

gree of dye retention the serum bilirubin determinations often give figures well above normal. From this it is seen that in cases of obstructice jaundice a knowledge of the amount of bilirubin in the blood serum gives a more accurate index to the degree of retention, and in cases without clinical jaundice it shows the presence of latent jaundice where the dye retention test does not permit definite conclusions to be drawn.

SUMMARY

1. Experimental evidence points toward the reticulo-endothelial system as being the chief source of bile pigment formation and towards the liver as being the secretory organ.

2. The van den Bergh test affords a means of detecting bilirubin. In obstructive jaundice its chief value is to enable the determination of latent icterus and to afford a means of accurately following the progress and regress of jaundice, both pre-operatively and postoperatively.

3. Obstruction to the outflow of bile seems to invalidate the use of the phenoltetrachlorphthalein test as a means of determining hepatic efficiency.

4. In cases of obstructive jaundice the results of this test are more or less analogous to those of the van den Bergh test, but it does not give as accurate an index to the degree of retained bile as does the latter.

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NOMINATION OF CHAIRMAN

Dr. A. deTalma Valk, Winston-Salem, was nominated for recommendation to the president as chairman of the section for the next year.

SECTION ON PRACTICE OF MEDICINE

Chairman: M. L. Stevens, M.D., Asheville.*

PERIODIC EXAMINATIONS OF APPARENTLY HEALTHY PERSONS

H. L. Brockmann, M.D., High Point

It is probable that very few of you have been appreciably interested in this subject heretofore, and that you have not anticipated with any degree of enthusiasm its presentation at this time. Consideration of it has been more or less thrust upon us because of the attention it has received elsewhere. Although the subject is as new to me as it is to practically every one of you, it is perhaps better that an ordinary physician such as I am should first introduce it for mutual discussion. Following this we should have the public health point of view and, if possible, the personal experience of someone, preferably a practicing physician, who has given a number of these examinations. I have reviewed, as my time permitted, the activities and attitude of other states regarding this movement and hope that we shall now become interested in it and make the most of it.

The whole idea behind the movement is to educate people in apparent health to go to their family physician at periodic intervals for a thorough physical examination and careful survey of their habits and conduct of living. By this means incipient diseases are discovered, as well as faulty habits of living which are likely to lead to sickness. The health client is advised fully of his condition and given specific directions as to how he may best remedy any defects or prevent their progress. In any event he is given all the assistance that a physician can give to keep himself fit to live his life as happily and completely as is possible. From an altruistic point of view that sounds fine, and we wonder why we haven't taken it up long ago. I am not here to say who started the idea or to relate a history of how it has been followed up everywhere. For that matter it is probable no one person is alone responsible for initiating the movement. I look upon it as merely the result of the outcry of a progressive civilization for something that gives fair promise to lift it to a higher plane of living.

The periodic health examination movement was first officially recognized by the American Medical Association in 1922. As a result of numerous requests from both medical and lay sources for a description of the methods of carrying out these examinations and the results to be expected the House of Delegates in June, 1922, instructed the Council on Health and Public Instruction to prepare forms for use by physicians in making these examinations and appointed a committee to work upon further details. The full import of the movement was quickly recognized, and in 1925 President W. D. Haggard promptly announced it as the major objective of his administration. As spokesman of the A.M.A. he presented the subject to many state medical societies and in practically

*Owing to the absence of Dr. Stevens on account of illness, Dr. T. W. M. Long was elected as acting chairman.

every public address he made during his term of office. By October, 1925, there was ready for distribution "A Manual of Suggestions for the Conduct of Periodic Examinations of Apparently Healthy Persons." It is the ardent desire of those who have faith in this movement to have a copy of this manual in the hands and mind of every physician in the United States. Its cost is twenty cents for a single copy or fifty copies for $4.50; and the information therein, whether approved or not, is well worth while. Surgeon General Stitt of the U.S. Navy has placed it in the hands of medical officers and advised its use in conducting annual physical examinations of all officers of the Navy. In November, 1925, during the incumbency of President Haggard and in conjunction with the annual conference of secretaries of constituent state medical associations, there was held a conference on periodic health examinations. It is interesting to review the proceedings. They appeared in the American Medical Association *Bulletin,* which you all receive. The program was divided into three sections. The first pertained to arousing the interest of the physician in the subject and educating him for the thorough, effective conduct of periodic health examinations. The second section was devoted to the technic of making these examinations and the third to the education of the laity as to their importance. From the review I have made of this program I assume that most progress in the matter has been made by New York, Illinois, Maine, Indiana, Wisconsin and Pennsylvania. In no state has the work made more than a mere beginning. In those places where the movement is active, the reports are favorable and the belief general that the movement has an enormous potential value.

I am not aware that in this state the subject has aroused any definite activity so far. Many of us have a few people come to us now and then to get the "once over", but on the whole we have not given much thought to this. Guilford County Medical Society, of which I have the honor of being a member, has had since January, 1925, a Committee on Periodic Examinations of the Apparently Healthy, but has not yet put its program in motion. I am wondering which will be the first county in North Carolina to get to work on this matter, if none so far has done so. We have in North Carolina machinery for carrying on the highest class of work of this kind, just as, for that matter, for doing anything else we want to do. I refer to this grand old state as a whole and in this matter particularly to this society and, first of all, to its constituent county societies. Next I refer to our very competent public health department, and finally to the many splendid public welfare organizations and to the intelligent population with which we have to deal. I know that in 1920 Dr. W. S. Rankin had in mind as an activity of the State Board of Health the institution of diagnostic clinics for the purpose of educating people to the idea of periodic health examinations. At this time he sought to have these done by local physicians, popularizing the examinations by propaganda from the State Board of Health, and to have those examined referred for the correction of defects to their own family physicians. It has been well established that this is the work of the general practitioner—the family physician. There has been much cry of late years concerning the passing of the family physician. We have recognized now that it is but the beginning of a

new era for this group of practitioners. As the domain of specialists becomes more crowded there is somewhat of a rebound to general practice. There may also be more profit in this than heretofore. The bugbear of State medicine seems to have died a natural death. The wonder now is that we ever thought of it at all. I look on the public health doctor with admiration—as a hero in the cause of progressive medicine. Public health work will ever be vital, but its extent will be limited. One of its chief functions, as I see it, is service as a medium between the public and physicians. As such it serves as a huge and free advertisement, encouraging people to look after their health and teaching them that physicians are in fact the real guardians of public and individual health. The eventual and bulk of public health work rightly falls in the hands of the practitioners.

Also well established is the fact that physicians in general are at present incapable of making these examinations. Now this may seem incredible and to cast hopelessness on the whole project; so allow me quickly to follow up that statement by saying that with a few hours of thought and practice the majority of us can acquire that ability. It is natural that offhand one can not light in and do a job at something as technical as this when he has never before tried it or given thought to it. The physician alone can do this job. As one speaker aptly described his taking it up, he did it much after the manner in which the merchant adds a new product to his stock, after several customers have called for examination "to see if there is any trouble"; and I hope we shall soon cease to pat them on the back and say that there is nothing the matter and to wait until something goes wrong.

So much can be said on this subject in general that I must confine the remainder of what I have to say to what I consider most essential, namely: to a brief description of the actual examination, to the type of advice given the health client, to preparing ourselves for the work and to educating the public.

The actual work of making a thorough and worth while periodic health examination requires from forty-five minutes to one hour after the physician has become accustomed to the task. A special form for recording the findings has been prepared by the A.M.A., and this or a similar form greatly facilitates the work. It would seem best that the examination be arranged for by appointment and that it be as free from interruption as is possible. The client can write out beforehand the information called for on the special form. This discloses his habits and manner of life possibly requiring modification in the interest of his health. The examination itself consists in the verification of these answers through such additional questioning as may seem appropriate in each case, in a thorough physical examination, a summing up of the findings, and hygienic advice to the health client. The physical examination and the proper hygienic advice are the two phases of the work for which it is generally conceded physicians taking it up need to prepare themselves. The former entails the use of methods and appliances with which all of us have at some time been familiar. It is generally easier to diagnose the disease in a sick person than it is to find everything that is wrong or likely to become wrong with a person who thinks he is well or to prove that he is physically sound in every way. The

physical examination consists in using in a systematic and orderly manner the following instruments used commonly in practice: Tape measure, tongue depressors, spot light, stethoscope, blood pressure instrument, otoscope, laryngeal mirror, Tallquist's hemoglobin scale or Dare hemoglobinometer, nasal speculum, vision chart (Snellen), rubber gloves or finger cots, vaginal speculum, weight scales; simple urine testing outfit for observing the appearance, specific gravity, albumin by acetic acid and heat test, and sugar by Benedict test or other standard test, thermometer, centrifuge, microscope, ophthalmoscope, flesh pencil, Wassermann tubes, reflex hammer, dynamometer, tuning fork. The abnormal findings only are entered on the printed form. After summing up the items in the client's way of living and physical condition which need correcting, such hygienic advice as the wisdom of the examiner dictates should be given in plain English. A copy of this should be kept, so as to enable the examiner later to check the client's progress. Frequently some medical treatment is indicated, and then suggestions as to diet, rest, exercise, work, social adjustments and recreation. To give the proper hygienic advice, aside from treatment on a patient basis, requires considerable thought and skill. We shall be able to give better advice after we have worked on these things a little more. Any one of us who is competent to make a thorough physical examination and consider his findings, along with the family and personal history, is likewise able to comprehend the advice (medical and hygienic) needed to get a person back to normal physical condition and to a healthy manner of living as far as is possible.

It does not seem to me so difficult a task to train ourselves to do this work. It is important, I believe, that we make the examinations in a more or less uniform manner. In several other places the work has been started by examining the physicians themselves. This can be done, and several meetings of each county medical society devoted to the training. In addition to this, of course, individual study on the part of physicians is desirable. We are exceptionally fortunate in having a well organized extension department of our state university which could do a great good in this field. With the coöperation of the A.M.A. and state and county medical societies there should be no difficulty in preparing ourselves.

Little has thus far been done in North Carolina to popularize the movement among the laity. The State Board of Health is probably waiting for the proper time to promote health examinations through its Health Bulletin; its publication, *Constructive Medicine;* and its contributions to the newspapers. When we, the doctors of North Carolina, show that we are in favor of health examinations I believe we can soon, through civic clubs, women's clubs, and welfare organizations, bring their importance to the attention of practically every resident of the state.

The results to be expected from establishing periodic health examinations generally and directing and encouraging people to keep themselves in prime condition for living are:

1. The recognition of regular medicine as the highest authority in all matters of health and disease and the discouraging of all false cults.

2. The reëstablishing of the general practitioner, the family physician, on a surer and saner footing than ever.

3. More careful and competent physical examination and diagnosis of both sick and well.

4. More work and more remuneration for doctors; also more doctors through increased demand.

5. A happier, healthier people, able to attain greater eminence in the realms of the physical, mental, moral and spiritual.

DISCUSSION

Dr. C. C. Hudson, City Health Officer, Greensboro: Dr. Brockmann has given us a very excellent presentation of this subject of periodic examinations. It is a subject in which all of us, as physicians, should be interested—we who are public health officials and those who are practicing physicians. We public health men realize that, as more and more we have the principles which Dr. Brockmann has laid down carried out by the private physician, our work will be made much easier; but we realize that it will be many years before they will be applied to all our population. It will be the ideal condition when we can have every person in North Carolina going to his family physician every year or six months (just as we advise them now to go to the dentist) to have his family physician give him a careful check-up on all the things given on this list. You check up on the patient and then give him directions along the different lines tto make him healthy. It will take an enormous amount of work on the part of all of us to bring this about.

To start with ourselves, what have we done to keep ourselves in the best possible physical condition? Are we checking up each year or having some other doctor go over us to see if anything is lowering our efficiency and if we are keeping ourselves in the best physical condition? We have to start with ourselves in order to teach others.

This is a great problem, and the solution of it will revolutionize medicine. It makes teachers of all us, because we must be able to teach our patients in order to impress them with the importance of carrying out the directions. I hope the time will come when the physician will be able to keep his patients well, as well as treat him when he is sick.

I think it is time to start this work somewhere in the state. The importance of it was impressed upon me recently in examining a number of applicants for positions on the police force. There were sixty of them. They were men who should be able to run, take exercise, etc. One had a blood pressure of 216; one of 170; two had a blood pressure of 160. Some had ear defects, eye defects, and pyorrhea. A number of other defects were found in those men, and several of them should have been under the care of physicians. If we took our entire population and went over them, the number that would need care would be tremendous. Many would need care for years and years. It will require work, very careful work and rearranging our daily schedules and the setting aside of a certain part of the day for doing this work.

I hope the day will come when Dr. Brockmann's idea, as presented in this paper, will be carried out in every county and every city of North Carolina.

Dr. Hubert B. Haywood, Jr., Raleigh: Dr. Brockmann has covered this subject in such a splendid way that I feel there is very little I could say that would add to what he has said. I believe that the idea of periodic health examinations is one that is growing with the public and growing at a little more rapid rate than with the physicians themselves. The Life Extension Institute, by extensive advertisements and by the merit of its advice to its clientele, has caught the attention of the reading public. I was recently asked to address a civic organization in my home town on the subject. When we consider that circulatory diseases are claiming an increasing toll of deaths in this country and in our own state, it is time to consider ways of combating them. Iife is being prolonged, it is true; but when you come to analyze that you will find that it is being prolonged in the earlier ages of life by prophylactic measures. In the last two decades the mortality from circulatory diseases has increased over ten per cent., and often the most valuable men in our community are taken. Periodic health examinations are the prophylactic measures to prevent this.

I have found the forms prepared by the American Medical Association a most useful help. Supplemented with a careful examination, we are giving our client a good value for his dollars.

I was struck by Dr. Haggard's inaugural address at the recent meeting of the American Medical Association, in which he advised that the best birthday present a man could make to himself is a periodic health examination. The public is already sold on the subject; all it needs is a little more urging by the profession. A real service is rendered to our community, and an increasingly useful and dignified field is added to the scope of our practice.

Dr. Brockmann (closing the discussion): I anticipated that this idea of the subject would be rather new to most of you. It certainly was new to me until I looked into it. Before reviewing this subject I had the idea that a periodic health examination was very much like an insurance examination, but I find it is much more than that. If this movement is to have any effect in North Carolina it has to be started, I believe, through the state society or through the component county societies. I wish enough interest would be taken in it by this section, or by the state society, to cause a committee to be appointed to get the movement started and to ascertain the best way to go about it. This work is not to be done free, and it is difficult to say just what the price should be. It is worth much more than we could possibly get for it; but we should, I think, make a minimum charge and do this work along with our general practice, letting it become part of our practice. I think one reason we do not do this is that there is not enough competition among doctors. It is a hard job to make a thorough physical examination and advise people how to live. For my part, I should be willing to see two or three times as many doctors in North Carolina as there are now, for as long as each has about all he can do there is no opportunity or desire to take up new work of such magnitude. It is not altogether that we are lazy. The Life Extension Institute has accomplished something but will never be able to cover this field. This has to be a personal matter between the physician and his patient. I hope the time will come, and I think it will, when the family physician will take

as much pride in preserving the health of his patients and keeping the family in good health as he does in bringing them out of serious illness.

The idea of encouraging a patient to come on his birthday for a health examination is a good one. I have a friend in Charlotte who says that he asks his patients when their birthdays come and jots it down, and tells them that the best present they can give themselves is to come in on their birthdays and have health examinations. If a patient does not want to make this gift to himself, he can have some member of the family give him five or ten dollars for it.

DIARRHEA

Paul F. Whitaker, M.D., Kinston

During the three years that I have been doing clinical work, I have been consulted by or had referred a goodly number of patients whose chief complaint was diarrhea of long standing. The analysis of the symptoms has proved an interesting clinical study and has formed the basis of the discussion which I shall present to you today.

The term diarrhea implies an increased frequency of stools of lessened consistency. It is not within the scope of this paper to discuss the acute diarrheas, such as those due to improper food, intoxications, or the specific infections, such as typhoid fever, cholera, and dysentery, or that associated with the onset of acute infectious disease, but rather to deal with the chronic form, under which heading I shall include the recurrent and intermittent types of the complaint. Broadly speaking, chronic diarrhea may be classified as organic and functional, taking up in anatomic order that arising from organic disease in the gastro-intestinal tract and then considering those cases arising from external nervous stimuli remote from the gastro-intestinal tract. Adhering to this classification, then, I shall first consider diarrhea of gastric origin.

Gastric Diarrhea. This type of diarrhea is more common than is generally recognized, and I do not believe that it receives the attention that its frequency deserves. Achlorhydria, or absence of hydrochloric acid, occurs in a variety of conditions. It undoubtedly occurs in individuals who are apparently healthy and symptom-free. It is a common finding in chronic gastritis, carcinoma of the stomach, pellagra and sprue; and it is almost a constant finding in pernicious anemia and combined sclerosis of the spinal cord. It is important to note that in the latter conditions the anacidity often antedates their appearance; and it is possible, as Vanderhoof has suggested, that it is a predisposing factor in the disease. His suggestion that the administration of HCL be used as a prophylactic measure in cases of achylia gastrica is certainly worthy of trial. In the majority of cases of gastric diarrhea there is either a total absence or marked diminution of free HCL in the gastric juice; and as the administration of the dilute acid practically always relieves the symptoms, it would seem that the deficiency is the essential factor in its production. The food, being poorly digested in the stomach, when it enters the intestine acts as a mechanical irritant.

The clinical features of gastric diarrhea are as follows: The evacuations usually occur in the morning after the patient has eaten breakfast and range as a rule from three to six in number. They are usually loose

and unformed rather than fluid and are not accompanied by colicky pains. On a diet containing meat, undigested meat fibers are present in the stools, due to poor gastric digestion. If associated symptoms are present, they are referred to the stomach and consist of epigastric distress, slight nausea, weakness, sinking feelings, and intolerance of alcohol and fluid meals. Acne rosacea has been shown by Barber and Rylee to be present in a large proportion of cases of achlorhydria. Examinations of the abdomen and rectum are negative, and fractional gastric analysis reveals either an absence or diminution of free HCL and a very low curve of total acidity. Fluoroscopic examination shows the barium meal to be rapidly forced through the alimentary tract. The therapeutic test of giving acid is of importance as a diagnostic point where other methods of investigation are not available.

There is one other type of gastric diarrhea, that occurring after gastro-enterostomy. It is caused by a too rapid emptying of the stomach, not permitting complete gastric digestion. Pancreatic digestion may also be inadequate. The stools are light in color and contain undigested meat fibres but no blood or mucus.

Diarrhea Originating in the Small Bowel. Chronic diarrhea originating in the small bowel is due usually to tuberculous ulceration of the ileum, though constipation may be present in this condition instead of diarrhea. The frequency of the stools is variable, depending somewhat on the extent of ulceration. As a rule the daily number of stools ranges from four to eight, a somewhat higher average than that of gastric diarrhea. Unlike the diarrhea of gastric origin, the patient suffers considerable pain, which is usually present around the umbilicus and the lower right quadrant. Soups and warm fluids are poorly borne and usually aggravate the symptom. The stools are soft or semifluid and light in color; and while microscopically blood is not usually present, it may be detected as a rule by means of the benzidine test. If the ulceration be very extensive, and particularly if there be involvement of the mesenteric lymph glands to such an extent that the lymphatic flow is obstructed, the stools may be very large and chalky looking and contain excess of fats and soaps. In the latter case, the diarrhea may be explained by disease of the absorptive system rather than the ulceration. The absorptive system consists of the intestinal mucosa and the lacteal system leading off into the mesentery. Any disease involving the mesenteric lymph glands, such as tuberculosis and malignancy, results in a blockage of the system with a resulting fatty diarrhea. The stools are bulky, containing much fat, and are pale and greenish in color. They are greasy, rancid, and foam like soap when mixed with water. Tropical sprue gives a stool conforming to this description; and this type of stool occurs in the so-called pancreatic diarrhea, which may possibly occur in certain diseases of the pancreas such as chronic pancreatitis.

Diarrhea Occurring in Colonic and Rectal Disease. This group of diarrheas is a very important one and one which is beset with considerable diagnostic difficulty. Careful histories, careful physical examinations, and, above all, careful digital and visual examinations of the mucous membrane of the large bowel with the proper instruments, along with both macroscopic and microscopic examination of the stools, tend

to lessen the chance of error. I dare say that quite frequently cases of diarrhea of long standing are treated for dysentery or colitis, when a simple digital examination would reveal a mass in the rectum which would serve to put one on his guard.

Of the ulcerative conditions of the colon leading to diarrhea, the following are the most important: Amebic and bacillary dysentery, tuberculosis, syphilis, and malignant disease. Certain symptoms common to all ulcerative conditions of the colon are best considered together. Pain is a frequent and almost constant symptom. It is colicky in character and is referred to the lower abdomen, occurring chiefly over the region of the descending colon and rectum. It is made worse by the act of defecation. The diarrhea may be continuous or intermittent and may alternate with constipation. In the acute stages the stools are usually small and frequent and consist mainly of blood, mucus, and sometimes pus; while in the more chronic stages they are more watery and contain more fecal material. Tenderness is usually elicited over the colon.

The diagnosis of bacillary dysentery is usually difficult. According to Shiga, this disorder is only a subsequent disease in which it is impossible often to isolate the dysentery bacillus. This uncertainty in laboratory diagnosis renders a visual examination of the affected area all the more important. In this condition the mucous membrane of the bowel is studded with shallow ulcers whose margins are not raised or undermined. The intervening mucosa is red and swollen and bleeds easily. A film of mucopurulent material usually covers the ulcers. In the chronic form of amebic dysentery the ulcers are small, round, and appear as tiny craters on an elevated area. The ulcer craters usually contain a yellow slough, which gives them the appearance of small boils. The intervening mucosa appears healthy. This appearance of the mucosa, coupled with ten to twenty stools a day containing mucus, pus and blood, fever and emaciation, and finally the detection of amebae in the stools, clinches the diagnosis.

Tuberculous ulceration of the colon may give rise to diarrhea alternating with constipation. This condition is rather a common complication of pulmonary tuberculosis but may also occur as a localized tuberculosis around the ileocecal valve, or as a tuberculous ulcerative colitis. Diarrhea is more pronounced when the lesion is in the lower bowel. Pain is the most frequent symptom, occurring usually in the lower abdomen, and is most severe during a bowel movement or after taking food. The finding of the tubercle bacilli in the stool is of little significance, as they are frequently found in cases of pulmonary tuberculosis.

In syphilitic involvement of the large bowel diarrhea is usually present, though at times the stools may be semisolid. The appearance of blood in the stools is uncommon, but they contain considerable amounts of mucus and not infrequently shreds of tissue. The most common lesion of syphilis is in the rectum, and when it occurs here it offers little diagnostic difficulty. The characteristic picture is an elevated ulcer with indurated edges and a smooth base, which gradually but surely tends to stricture formation. A positive Wassermann clears up the diagnosis.

Carcinoma may occur in any portion of the large bowel, and when it occurs in the rectum there is usually a constant desire to defecate, with colicky pains. The stools are watery and contain much mucus; when

ulceration is present they contain blood. If the seat of the lesion is higher up in the colon, diarrhea is not a striking symptom. This condition usually occurs in patients beyond middle life, and there is a history of progressive loss of weight. In advanced cases an abdominal mass may be palpated, and if the lesion is in the rectum it can be readily detected by digital examination. In the diagnosis of malignant disease of the colon, radiographic and fluoroscopic examinations by means of barium enema are particularly valuable, and the location of the lesion and the extent of obstruction can usually be determined in this manner.

The Condition of So-called Polyposis. Polyposis intestinalis may sometimes cause diarrhea of long standing. This was impressed upon me very forcibly by a case that came to the Virginia Hospital in Richmond while I was an interne there, and which I shall recite briefly. The patient was a man 52 years of age who complained of diarrhea of ten years' duration. The movements were watery and contained blood and mucus. Exhaustive studies were made, which gave no satisfactory explanation of the diarrhea. The rectal examination by means of a speculum was entrusted to me, and I reported it negative. The case finally came to autopsy, and I was considerably chagrined to have the pathologist demonstrate a colon that was studded with polyps from the cecum to the rectum.

Mucous colitis is an artificial form of colonic diarrhea. It is most likely a purely nervous disease, the mucus formed being due to a nervous hypersecretion. The picture of this condition is a familiar one, occurring in patients of a particular nervous type who suffer from chronic anxiety and depression. They suffer considerably from abdominal pain, referred especially to the descending colon, which may often be readily palpated as a hard cord. The evacuations are too frequent, and the patients state that they have diarrhea. The stools are passed with large quantities of mucus, which may take the form of long casts. Blood and pus are absent, and the mucous membrane appears normal. The condition is really one of spasmodic constipation, and the large quantities of mucus are the result of oversecretion rather than actual inflammation.

Reflex Diarrhea. Reflex diarrhea is a condition that may occur in mild disease of the gastro-intestinal appendages, such as the gall-bladder and the appendix, and may be explained on the same basis as the reflex digestive disturbances that occur in these conditions. In gall-bladder disease there is very commonly gastric anacidity, which may play a part in the etiology; while in appendicitis the pericecal or perirectal inflammation may be a factor. In frequency and appearance the stools resemble those of gastric diarrhea.

Emotional Diarrhea. Emotional or nervous diarrhea is fairly common and a very distressing condition to those affected with this complaint. It is purely a functional condition and is a manifestation of an anxiety state. All grades of it are encountered. One individual may have a mere tendency to diarrhea at the usual times of defecation or on occasions of especial stress or strain, while another unfortunate individual may so lose confidence in his ability to control his bowels that it becomes impossible for him to attend any function at which self-consciousness is likely to prevail. Being out of reach of a toilet under such

conditions becomes a source of dread and anguish to him. The condition is a visceral neurosis, closely akin to the nervous frequency of urination so commonly noted. To illustrate this condition, I recall the incidence of a mother who had eight calls to stool in a hour and a half, just preceding a pneumonia crisis in the case of her son, who was desperately ill. She stated to me afterward that any circumstance that made her nervous or activated her emotions caused this condition.

Other conditions that may give rise to an essentially chronic diarrhea, and which I shall consider briefly, are lesion of the brain and spinal cord, disturbances of the endocrine system associated with disturbed metabolism, intestinal parasites, and lastly cardiorenal disease. In diseases of the brain and spinal cord, the diarrhea is explained by a disturbance of the neuromuscular apparatus of the colon and particularly the anal sphincter. The stools are loose and watery. The diarrhea occurring in diseases of the endocrine system is most probably due to a simple hyperperistalsis. It is particularly prone to occur in hyperthyriodism. The diarrhea occurring in infection of the bowel with intestinal parasites, such as the various worms and flagellate organisms, appears suddenly and without apparent cause. Smithfield has pointed out a diagnostic factor, namely, that of normal stools alternating with diarrhea. The stools are alkaline in reaction, brown or yellow in color, and contain mucus, pus and at times blood. The diagnosis of this group of diarrheas may usually be made by finding the offending organism in the stool. Diarrhea in cardiorenal conditions is of fairly common occurrence. That occurring in myocardial insufficiency is explainable upon the basis of chronic passive congestion of the intra-abdominal organs. The diarrhea of nephritis is most probably due to the excretion into the bowel of irritating toxins, the diarrhea varying with the exacerbation of the nephritis. In patients suffering with chronic nephritis and uremia over a long period of time, uremic ulcers may develop in both the small and large bowel; and severe and even fatal diarrhea is prone to develop, with hemorrhage.

DISCUSSION

Dr. Edward J. Wood, Wilmington: This admirable paper of Dr. Whitaker's is peculiarly well timed. The thing that impresses me most favorably about it is the fact that he has arranged his discussion in an anatomical way. There is no doubt that the most neglected field of medicine in North Carolina is the chronic diarrheas. I remember twenty years ago, when it was supposed to be an impossibility to have amebic dysentery in North Carolina, our cases, as was the general custom in those days, were rushed off to the Hopkins, where the diagnosis was made. I do not suppose there is a single place in the world where the incidence of amebic dysentery is greater than in eastern North Carolina, and I do not suppose there is a single medical point in the world about which the profession is more universally ignorant than the microscopic diagnosis of amebic dysentery. There is as much error in this section of the South in diagnosing amebic dysentery that does not exist as in the diagnosis of malaria that does not exist. Every time a patient from this part of the world goes to a northern hospital it seems to be the intern's idea that malaria must exist and therefore he must

diagnose it, whereas nowadays one finds the parasites almost as often in Richmond and Baltimore and other cities as in eastern North Carolina.

I do not suppose there is anything more universally and generally overlooked than the fact that the patient with an achylia gastrica will frequently manifest diarrhea. The fact that very many people are born without free hydrochloric acid in the stomach is also overlooked. I remember Dr. Arthur F. Hurst, in Guy's Hospital, used to divide people into three classes: those having hyperchlorhydria, normal hydrochloric acid, or hypochlorhydria. The diarrhea of achylia gastrica is peculiar in that it may appear after strain of any sort: after influenza, after hot weather, or in any condition in which the organism was taxed.

Another thing overlooked, because in this part of the world we have assumed that we are free from it, is flagellate diarrhea. There has been a great deal of discussion as to whether flagellates will produce diarrhea. I have seen quite a number of cases in this part of the state; and my associate, Dr. R. H. Bellamy, has had a series of such cases. It ought to interest this Society to know that Harvey Barret, of Charlotte, was the first person who succeeded in growing the Chilomastic mesnili. We ought to remember that practically all the flagellates may occur in North Carolina, and frequently do occur in North Carolina, and there are probably some flagellates occurring in North Carolina that apparently up to this time have not been classified. I do not know of any more promising field for investigation than the diarrheas of North Carolina, and I do not know of anything that will bring more returns. If this paper will stimulate some young man to do the microscopic study of the feces in every diarrhea, it will have served a great purpose.

Dr. W. R. Stanford, Durham: I should like to ask Dr. Wood what, in his experience, has been the best method of treating cases of flagellate diarrhea. I have used enemata and emetin and other treatments in several cases I have had during the last few weeks but without very good results.

Dr. Wood: The whole treatment of flagellate diarrhea is unsatisfactory. There have been just as many things tried in the treatment of flaggellate diarrhea as in the treatment of amebic dysentery, but none has been universally successful. Many of these cases are said to clear up under methylene blue.

THE DIAGNOSIS OF ACTIVE INCIPIENT PULMONARY TUBERCULOSIS.

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By this is meant the earliest form of pulmonary tuberculosis which can be recognized by the usual methods at our command. The importance of early recognizing this condition is admirably emphasized by Dr. P. P. McCain, Superintendent of the North Carolina State Sanatorium, who wrote: "A recent survey of the after-results of treatment of the 3,000 patients discharged from the North Carolina Sanatorium during my service over the past ten years shows the following:

Of the incipient cases 89 per cent. are living and 80 per cent. are working.

Of the moderately advanced cases 59 per cent. are living and 44 per cent. are working.

Of the far advanced cases 27 per cent. are living and 13 per cent. are working.

How eloquent are these figures of the need of an early diagnosis!"

In presenting this subject it is not intended to bring out any newer methods but to review for our mutual benefit some of the more commonly accepted views used in the diagnosis of this disease. Our interest in this condition can not be too frequently stirred, for only by an early diagnosis can we ever hope to eradicate this "great white plague." The disease, when recognized early, is as easily arrested as almost any of the major conditions for which we are consulted. We have made some progress toward eradicating tuberculosis, but our fight has just begun. I do not know just how many cases are yet not recognized, but I do know we are finding more than we did; not that we have so many more new cases, but we are learning more about them and are trying to find them. The State Board of Health and the Red Cross are unable to meet the situation unless we do our full duty all the time, for the reason that these patients usually first apply to us for relief. It is upon these first visits to our offices that we should make a complete survey of the cases. The time may have been when the asking of a few questions and giving a prescription would have been accepted by a majority of patients, but not so to-day. There is no excuse for any of us to permit a patient to repeatedly apply to us for relief and we sit idly by and not make a thorough examination in an honest effort to really make a diagnosis. In the event you have failed to make an honest-to-goodness examination, please, for Heaven's sake, do not pat the patient on the back in a reassuring manner with the statement that he has lungs equal to a blacksmith's bellows, and that his lungs are the best which you have ever examined. If there is an unpardonable sin in medicine, I believe this to be the ace of spades in blackness.

The average person to-day is aware that his lung tissue is not all located underneath his breast plate, but that it extends east, west, north and south, and he expects any reputable physician to know the anatomic location of this lung tissue. Do not fool yourself. The time is rapidly arriving, through medical education of the public, when it will be impossible for us to fool or deceive the public. We must get away from the old slipshod, obsolete, no diagnosis of "run down condition," "nervous indigestion," "spring fever," "biliousness," "ovary" or "female trouble," "neuralgia of the heart," "growing pains," or "bad blood." These are camouflages of ignorance. They have been overworked and are as much out of place in our profession to-day as a tick-infested scrub bull among a herd of thoroughbred Holstein cows. If we insist on using "the bull" we should select some subject upon which human happiness and health do not pivot.

As to the complete examination, I hear the age-old cry that "the patient will not pay me for a thorough examination and the time consumed in making a diagnosis." This will depend upon you, the examining physician. I can speak only from experience and from what I have learned by inquiry among my professional friends. I am of the opinion, after ten years of experience, that when a physician explains

to the patient that a thorough examination is needed to make a diagnosis and for this thorough examination an extra fee will be charged, the patient invariably and willingly consents. In the end these are our very best patients, for they pride themselves in the fact that "Dr. So-and-So knows all about me because he gave me an all over examination." These patients pay and boost better than any class of patients I have. The public have learned that they can not hope to consume even a garage man's time and not pay him for it.

So much for the preliminary. Now we can proceed in our effort to make a diagnosis of active incipient pulmonary tuberculosis. Before attempting this I wish to state that it is one of the most difficult diagnoses that I am called upon to make. In this paper I shall not attempt a differential diagnosis but to outline the more prominent reasons for arriving at a diagnosis. Briefly, and in order of their accepted importance, the diagnosis may be considered under five cardinal points. (1) history; (2) symptoms; (3) physical signs; (4) x-ray signs; (5) specific reactions.

I. *History*: (a) The presence of tuberculosis in the family. This is not serious as a matter of *heredity* but means everything so far as *environment* is concerned.

(b) Unusual exposure to the disease, as parents, nurse, or any intimate association with the disease, particularly during the patient's childhood or pre-adolescent period.

(c) Debilitating circumstances, chronic illness, focal infections, worry, dissipation, unhygienic surroundings.

(d) Occupation is of minor importance.

II. *Symptoms*: (a) Loss of weight. This may be traced back for a period of ten years in an adult. In children a failure to gain throughout a period of six months is considered a loss of weight. The loss of weight is always more suggestive if it occurs in spring and summer. A tuberculous patient withstands warm weather very poorly.

(b) Pain in chest. This is one of the most conspicuous symptoms. It may be sharp and knife-like in character; it may be just one small sore spot in which its location is indefinitely outlined by the patient. These areas of pain are usually produced by pleurisy.

(c) Temperature. The morning temperature normal or subnormal; the afternoon temperature elevated, maybe very slightly. The temperature should be recorded every three hours for a period of ten days, and the amount of exercise always recorded. A persistent subnormal temperature, provided the afternoon temperature more nearly approaches normal, is suspicious.

(d) Indigestion and gas, uneasiness after meals, and loss of weight are frequent and common symptoms; also loss of strength and inability to perform usual duties without tiring.

(e) Cough may be present but is *more commonly absent*. A morning cough in patients other than cigarette smokers is suggestive. The cough if present is usually hacking in character. Expectoration may be present, but it is rare in the early stage.

(f) Pulmonary hemorrhage may occur as the first symptom or it may never appear. Early in the disease it is always a good prognostic

indication, as the hemorrhage frequently produces a clearing of focus and a good organized blood clot is formed. Further, it hastens the patient to secure professional aid; it gives him a fright, and he will be more cautious in his hygiene.

(g) Repeated attacks of "grippe" or bad colds from which patient recovers slowly; usually there is a hacking cough left that yields to treatment stubbornly.

(h) Sputum. The amount varies with different individuals. *If present* there is more in the early morning. Repeated stains should be made for tubercle bacilli. Some laboratories digest the sputum and then centrifugalize as in examination for casts in urine. If sputum is positive, the diagnosis is easily made. I prefer, however, more than one positive report, with the relative number of bacilli found in one field. A negative report does not prove the absence of tuberculosis.

III. *Physical Signs*: Before attempting a physical examination, it is obviously important that a good direct light, preferably daylight, be present; the patient should be nude to the waist. For the female a "Y" drape may be employed.

Irrespective of what the *physical findings* may be, *unless we can obtain a history and symptoms* as above outlined, or at least a major portion of them, *we may usually ignore these signs.*

(a) Inspection: Watch carefully for the lagging chest wall as a whole, then detail the supra- and intraclavicular fossae. Notice for drooping shoulders, the length of line from shoulder to the neck; watch for differences of the interspace. Considerable information may be obtained by careful inspection.

(b) Palpation: Variations in vocal fremitus are to be noted. Some claim to detect a difference in the resistance offered. I cannot.

(c) Percussion: Light and heavy percussion may be employed with distinct advantage. The impaired resonance that you may find over the apex of the affected side indicates *anatomic* changes in the area examined.

(d) Auscultation: Go over entire lung by having patient breathe through his mouth as naturally as possible, nothing any variations from normal. Then have patient make deep respiration, observing anything of note. Follow this by deep inspiration and, at the end of expiration, have patient give a little cough. The localized apical rales that may be produced are characteristic of what is to be expected in incipient tuberculosis, particularly should these rales persist. *Granular breathing,* if present, is now recognized as one of the earliest physical signs manifested in incipient pulmonary tuberculosis; however, it is not present in every case. This type of breathing is a rough sputtering type. It is produced by air forcing its way into the partially collapsed vesicles, which expand independently instead of synchronously.

Feeble breathing is next of importance to granular breathing. It is slightly less distinct than normal. For instance, in going over the chest we note that the breathing is quieter or less distinct in one lung; we recognize feeble breathing by comparison. If feeble breathing is present in the apex it is more significant of incipient tuberculosis.

Prolonged expiration is third in importance and is more easily recognized. The respiratory murmur here is usually the harsh, high-pitched bronchial quality of breathing. It is heard, of course, on expiration, as the term implies. The normal differences between right and left apex are to be kept in mind; there is to a greater or lesser extent prolonged expiration over right apex posteriorly. This, however, rarely extends below the seventh cervical vertebra. Also in children there is a tendency toward an exaggeration of the normal.

Vocal resonance is but rarely altered in incipient tuberculosis. We expect to find this in advanced cases.

IV. *X-Ray Signs*: Here we come to the debatable point in the diagnosis. Some roentgenologists make the bold assertion that they can positively make a diagnosis of incipient pulmonary tuberculosis; others of this specialty say they can demonstrate tubercles which are indicative of this condition, while others speak very conservatively and say they can demonstrate the anatomic changes in lung structure. We have able clinicians who do not agree with the first assertion but find the latter conservative interpretation invaluable in the diagnosis of the lesion. The stereopticon plate is the shadow of preference and is invaluable in making the diagnosis. Very frequently the employment of x-ray is more valuable as an aid in excluding other confusing conditions of the lung than as used for the diagnosis of incipient tuberculosis. The fluoroscope is very valuable in estimating the freedom of respiratory movements, particularly at the apices and bases of lungs. Further, the free use of x-ray is useful to make permanent records, and later a comparison may be made as to effects of treatment. The x-ray should be employed in every suspected case.

V. *Specific Reactions*: The technic of these reactions will be omitted, as it can be readily found in any good textbook of medicine.

A positive reaction to one of the tuberculosis skin tests is generally accepted at the present time as evidence of a tuberculous infection *somewhere* in the body. A positive test, however, does not mean that the patient has clinical tuberculosis. It should be kept in mind that *there is a vast difference between a tuberculosis that is clinically recognizable and a hypersensitiveness to tuberculin.* Hypersensitiveness to tuberculin is present in a large proportion of healthy people, and it is a mistake to believe they need active treatment for tuberculosis just because they react positively. On the other hand, a negative reaction does not entirely free us from responsibility. The *intradermic* test is more sensitive; but for general practitioners the cutaneous or Von Pirquet test is the preferable tuberculin test to employ, on account of its simplicity and its generally accepted reliability. When this test is positive in a child before the end of the second year it is generally accepted as evidence of clinically active tuberculosis. Beyond the second year it loses much of its value as a diagnostic sign. The conjunctival test is mentioned only to be condemned, as it is liable to produce serious complications in the eye.

In conclusion, permit me to review briefly the five essentials in the diagnosis of active incipient pulmonary tuberculosis.

History: Take time and secure the major factors as relate to this condition.

Symptomss "Seek and ye shall find, ask and it shall be given unto you." This applies here equally as it did in years long past. Secure detailed symptoms of all past and present trouble.

Physical Signs: Can be obtained by any normal physician who still possesses four of his five special senses plus some energy and a determination to get the facts.

X-Ray Signs: X-ray facilities are within reach of nearly every man in the state. The North Carolina Sanatorium will make x-rays at cost if you will only arrange for an engagement. Use the x-ray freely; you will find it a valuable aid.

Specific Reactions: Very helpful before end of second year, of doubtful value after that age. Use them; they may be good alibis for the future.

Finally: After you have done your best and you are not sure of your diagnosis, play the game squarely and tell your patient. On the other hand, if you are reasonably sure of your diagnosis so inform your patient and trust the Great Physician to say, "Well done, thou good and faithful servant."

THE CARE OF THE TUBERCULOUS PATIENT AFTER LEAVING THE SANATORIUM

J. W. Dickie, M.D., Southern Pines

In any case of tuberculosis recovery depends upon a reasonably early diagnosis, followed by treatment preferably in a sanatorium under competent medical supervision until the disease is arrested, and then by proper supervision of the patient after discharge. I shall first discuss briefly the treatment in the sanatorium, because it is so closely allied to the care and supervision of the patient after discharge.

The best sanatoria leave much to be desired. However, the average sanatorium offers superior advantages to anyone with active tuberculosis. Physicians treating large groups of patients under identical climatic conditions have an opportunity to observe the advantages to the patient of treatment in a sanatorium to that in a private home. The mistake most frequently made is a needless delay in seeking institutional treatment. The patient almost invariably seeks such care when his condition becomes desperate. If the importance of such a course is impressed upon him, and he is made to realize that one goes to a sanatorium to get well, not to die, he may, in most cases, be induced to go early. With very few exceptions, the results of proper sanatorium treatment are most gratifying, where a reasonably early diagnosis has been made. The patient may as well know at the beginning that the period of treatment may be all the way from five months to two years, depending on the extent of the involvement, the degree of activity, the resistance of the individual to tuberculosis, and his ability to adapt himself to the cure. Frequently patients leave before a result is obtained; or they may go from one sanatorium to another, usually with results disappointing both to the patient and the sanatoria concerned. They are often encouraged

to act thus by well-meaning friends and relatives. Every patient can find a plausible excuse to leave if he wills to do so. Frequently financial embarrassment is the reason given, yet it is significant that desperately ill patients are rarely forced to leave on this account.

If the period of treatment be divided into three stages—bed rest, chair rest, and graduated exercise, it is of the greatest importance for the patient to remain in the sanatorium during the period of graduated exercise, under the closest supervision, where every hour of the twenty-four is accounted for. It is difficult to explain satisfactorily to a patient and his family the necessity for continued institutional care after all symptoms have subsided, especially when there has been a gain in weight of from fifteen to fifty pounds and the patient looks and feels better than ever before in his life. The patient usually reaches this point of the cure by the time he has completed the period of bed rest and chair rest and before he has begun the very important exercise period. At frequent intervals, while the patient's exercise is being increased, a careful chest examination by a competent physician is necessary. The difference between omitting or completing the third stage of the cure is often the difference between a permanent cure and a temporary arrest. After an early return home, "patched up," many patients break down again in a few months or a few years, and must return to the sanatorium when most likely it is too late to effect a cure. Such cases represent a very large percentage of the fatalities in institutional practice.

With the exception of a small percentage of cases in which we resort to such measures as tuberculin, heliotherapy, thoracoplasty, and pneumothorax, the treatment is so simple that it is difficult to convince the patient of its importance; yet its simplicity is its virtue. The question is often asked: Is there a specific for tuberculosis? The answer is, yes. The specific is REST. In truth I regard it as being as nearly a specific as we have in the field of medicine—not rest in the sense of stopping work and "taking it easy", but rest as it is used in treating a fracture. Then we immobilize the part by the use of a cast or splints. Nature also protects the man with a fractured bone, for in the attempt to use the part such pain results as to force complete rest while the tissues are healing. The same is not true in the case of a diseased lung, where the patient has little or no discomfort. If complete rest is necessary to obtain the best result where the tissue is merely the seat of an injury, how much more necessary it is, then, where the tissue, as in the case of tuberculosis, labors under the greater handicap of being diseased!

The period of complete bed rest must continue until the disease is quiescent, whether the time required be six weeks, six months, or longer. The end of this period may be determined by a careful chest examination in conjunction with stereoscopic x-ray films of the lungs. If the average case requires eight months in the sanatorium, about half of that time is taken up by the bed rest period. The period of bed rest is followed by a period of chair rest, of from six to twelve weeks, depending on the length of time spent at rest in bed, on the nature and extent of original involvement, and on the reaction to chair rest. The period of chair rest is followed by a period of graduated exercise, which requires a minimum of two months. Before leaving the sanatorium the patient should be taking at least one and one-half hours' exercise a day. The exercise period

determines the patient's limitations; how much he is going to be able to do and how safe he is going to be in doing it. The patient gets his result in bed; the exercise period determines whether he keeps it or loses it.

There is no "diet" for tuberculosis. In the absence of any complications patients do best on wholesome, nourishing food, such as normal healthy people enjoy, with the addition of from a quart to a quart and a half of milk a day. The routine use of raw eggs, the old stand-by of former days, is to be severely condemned. Very few healthy people can properly assimilate any large number of raw eggs for any length of time, and the effect of several raw eggs a day on a patient's appetite is disastrous.

Dry, fresh air in an invigorating climate with an abundance of sunshine is an important aid to treatment. Sanatoria are usually so located and constructed as to give patients the greatest advantages in this respect.

To sum up, properly regulated rest and exercise, proper nourishment, fresh air, and sunshine, are our most dependable weapons against tuberculosis.

The patient, leaving the sanatorium as an arrested case of tuberculosis, has learned the significance of the word REST and its importance. He has experienced the well-being which results from taking proper nourishment at regular hours; he no longer feels comfortable or at ease in a poorly ventilated building, and he knows the joys of a sleeping porch, regardless of the season; he has learned a rare lesson which will go far towards insuring his success in after years—namely, self control.

Of immediate concern to him is the advisibility of returning to his former home. His greatest anxiety is about climatic conditions. In recent years we have changed our ideas about climate It is no longer the prime requisite to the patient leaving the sanatorium. Rest, not climate, is now the preëminent consideration in treatment; and the patient's activity or occupation is likewise the great consideration after leaving the sanatorium. To be sure, some discretion must be used; but it is safe to say the tuberculous individual, with his disease thoroughly arrested, may live in any climate suitable for the average well person. The patient who returns home from the West or any of the well known health resorts in the East and has a relapse does so not because of climatic conditions at his home. He may look the picture of health; but, in tuberculosis, there is nothing more deceptive than appearances. Sometimes he has not completed his cure, and his disease is not arrested. Many times he returns to the environment and occupation which precipitated his illness in the first place and tries to make up for lost time. In truth, what counts is this: not *where* they live, but *how* they live. Whenever possible, a period of from one to three months and sometimes longer should elapse between the time the patient leaves the sanatorium and the time when he resumes his regular occupation. He needs this period to readjust himself.

We have also changed our ideas about the occupation of the ex-patient. We used to regard outdoor work as best, nay as essential, regardless of how strenuous it might be. The bookkeeper was advised to become a cowboy, the banker a farmer. Experience has taught that this may be the worst possible advice. The ex-patient must avoid any work which requires excessive physical effort. Sedentary occupations are very much to be preferred, such as writing, teaching, bookkeeping, bank-

ing and the like. The hours of labor must be rational. A normal, healthy man is not at his best for any considerable period of time if he attempts to do more than eight hours' work a day regularly. The same is doubly true of the person who has had tuberculosis. A complete change should not be recommended except in rare cases, and then only after due consideration. A man can make a living with less effort and in shorter hours in a job he knows than he can in unfamiliar work for which he is not trained. It, therefore, often happens that an ex-patient is safer in his old unfavorable work than in a new more suitable occupation.

The hours spent in recreation and rest are of quite as much importance as the hours of labor. At least ten hours of every twenty-four should be spent at rest in bed; asleep if possible. Two hours of this time should be spent as a rest period immediately following the midday meal. If the person's work is so arranged as to make this possible, nothing will do more to insure him good health than a daily *siesta* following the midday meal. He must avoid any diversions which entail considerable exertion. Tennis is to be avoided, and golf is not advisable for a long time; especially if his lesion has been very widespread or very active. Diversions such as the movies, card games, auto riding and the like are safe and pleasant. The patient must be strongly advised against any former indiscretions or dissipations, such as excessive smoking or drinking.

The physician's advice will be sought in regard to marriage or, if the individual is married, as to the advisability of having children. In the case of marriage the advice of physicians is conflicting. In general, the physician who is tuberculous takes a more liberal view, the physician who is not tuberculous the more uncompromising view. If a person has had tuberculosis, has become an arrested case, and remains well for two years, I believe marriage is justifiable, provided the patient's financial condition will make it possible to weather the storm in case of another breakdown. After all, marriage of the tuberculous is largely an economic problem, for tuberculosis is not hereditary. If the second breakdown means financial dependence on relatives or friends or, even worse, if treatment will be impossible, marriage is to be strongly condemned.

When the patient is already married, the question of children depends first of all on his or her physical condition. There is a grave hazard attached to childbirth and the care of the child for the mother who is tuberculous. Even in incipient cases a period of not less than two years should elapse between the time of her assured arrest and the birth of her child. This, too, is in part an economic problem. In some respects the children of tuberculous parents have advantages over other children. Their parents know something about tuberculosis and the general rules of health. They will safeguard the health of their children more than the average parent. Their children are likely to have greater advantages in the way of health, education, and the selection of an occupation. For these reasons, the advantages may more than counterbalance any disadvantages in being the offspring of tuberculous parents.

Now, as to the last and most important consideration in the treatment of the patient after leaving the sanatorium. While under treatment he has become dependent on his attending physician for encouragement and advice. Being deprived of this anchor on his return home, the reaction is inevitable. He is prone to become unduly anxious about him-

self and to imagine all kinds of things are going to happen to him. This state of mind in itself is sufficient reason for insisting that the patient be under the watchful care and guidance of his family physician for a period of at least a year after he leaves the sanatorium. The duty of the home physician is, first of all, to assure relatives and friends that the patient's germs have been "bottled up" and he is not dangerous to anyone; but he must enjoin the patient to always take the same precautions he was taught to take. This relieves any embarrassment or anxiety for the patient or his family.

The home physician should make a careful chest examination at regular intervals for at least six months or, better, for a year. If the physician practices care in his examination and shows interest in the patient's welfare, the latter will look forward to these occasions. These examinations give the patient the assurance he needs so much; they make it possible to detect the first signs of a relapse; and, incidentally, they give his physician a splendid opportunity to become more proficient in every detail of chest examination.

Usually it is advisable for the patient to return to the sanatorium at the end of six months for a thorough examination. There all his previous records are on file, and by comparison any very slight change may be more surely detected. This examination should include stereoscopic x-ray films of his chest. If the patient leaves the sanatorium with this understanding, he takes better care of himself in the meantime. More than anything else he wants a good report when he returns for his examination. Further, it is during the first six months following discharge that he is most likely to relapse. If he remains well for a period of six months, his life from that time on may be spent more nearly as is that of other normal, healthy individuals. To paraphrase the words of the Apostle of old: "For the patient who has fought a good fight, finished his course and kept the faith, there is laid up a reward of health and happiness".

In conclusion, I believe there is no other chronic ailment to which mankind is heir which responds so readily and successfully to proper treatment as does tuberculosis. Could we teach the public to fully appreciate the value of health; were all physicians able to recognize the earliest signs and symptoms of tuberculosis; were proper sanatorium facilities available for every victim of tuberculosis; had we the proper cooperation between physician and patient, then in a short span of years the great white plague would be as infrequent as typhoid is today, and the victims of this dread disease would no longer be counted by the hundreds of thousands.

DISCUSSION OF PAPERS OF DRS. FINCH AND DICKIE

Dr. P. P. McCain, Superintendent, State Sanatorium for Tuberculosis, Sanatorium: I want to emphasize the importance of a history, a little more even than Dr. Finch did, in the early diagnosis. I think this is of more importance to the general practitioner than anything else at his command. I think the general practitioner (as many of you have heard me say before), the average general practitioner, should let history count for more than anything else; putting it in a statistical way, I should say 75 per cent. at least. Of course if you have a hemorrhage or

find tubercle bacilli in the sputum you can say flat-footedly, without any question at all, that it is tuberculosis; but if the case is not very definite, I think the doctor should tell the patient that there is a likelihood of his having tuberculosis and that he ought to take advantage of all the facilities at the command of the profession to find out certainly. If the general practitioner is not in a position to have x-rays made and is not skilled in physical diagnosis himself, he ought to send the patient to some one to confirm his tentative diagnosis; and he ought to make that tentative diagnosis in such uncertain terms that he will impress his patient enough to make him go for further examination. We who are in sanatorium work are distressed by the fact that there are more cases being sent to sanatoria, after all these years that the National Tuberculosis Association has been spreading the propaganda and education, and after all that the State Board of Health has done and all that other agencies are doing, with the better medical courses that we have and the better training in physical examination, we are distressed that more cases are being sent to the sanatoria far advanced than ever before. I can not figure out how it is. We know it can be explained in part by the fact that now, in the classification of tuberculosis, x-ray has to be taken into account. X-ray will almost invariably show more than the physical examination does, so that many cases are now classed as far advanced which formerly were classed as moderately advanced. But it is a fact that not only in North Carolina, but also throughout the country, as shown by national statistics, a larger number of advanced cases and a smaller number of incipient cases are being sent to the sanatoria than ever before.

I see Dr. Cocke and Dr. Allen and Dr. Lienbach and a number of others here who I hope will discuss these papers and give their opinion of the significance of the physical signs. My opinion is that rales count for more than anything else.

I think Dr. Dickie's statement about rest as a specific for tuberculosis should be emphasized more than anything else. The patient leaves the sanatorium looking well and feeling fine, probably looking better than at any previous time in his life. At no time is the Biblical quotation more apt: "Woe unto you, when all men speak well of you." The returned patient's friends feel sorry for him because he has been in a sanatorium and want to cheer him up by telling him he never looked better in his life, and after eight or ten of them have told him this, and have asked him to go somewhere or do something, he begins to think the doctor laid too much emphasis upon rest. So the main thing is to teach the patient how to rest at the sanatorium and how to rest after he goes back home. I think the most important way to get the patients to continue rest is to tell them to put themselves under the supervision of their family physician when they return home. Patients have a little tendency to feel that they know more about tuberculosis than does the family doctor; I think that is one of the great troubles about sanatorium treatment. Patients get the wrong idea; they think the doctor does not know anything about it and is not interested in them. There are a great many doctors in North Carolina to whom I would feel safer in sending back a patient who has been in a sanatorium for two months than in sending

back to other doctors a patient who has been in a sanatorium for twelve months. If the patient will put his confidence in that doctor and put himself under his care, he will do well.

Dr. J. M. Templeton, Cary: I regard these two papers as being the most important so far presented at this meeting, and I believe Dr. Finch's paper is on the most difficult problem the general practitioner has to handle. Up to twelve or fifteen years ago I thought I could make a curbstone diagnosis of tuberculosis. If a fellow came in with a little hacking cough, breathing a little rapidly, and emaciated, I felt sure he had tuberculosis. I attended a meeting of the society at Durham some years ago at which there was a symposium on tuberculosis, and at which authorities from all over the country had assembled. In the course of the lectures, probably the first man who spoke on the subject was asked how long it would take him to make a diagnosis of incipient tuberculosis, and he said he would want about ten days. The next man that got up to discuss the question, and I think that was Thompson, of Texas, said if he wanted to make a diagnosis of incipient tuberculosis he might want a month to do it. So I began to see the importance of studying this question, and I revised my ideas as to my ability to make a diagnosis. I invariably take ample time; and then if there is any doubt about it I follow the advice of my friend McCain and send them to him provided they have money enough to go that far. You know we country doctors sometimes have patients that have not money enough to take them that far and back.

As to the treatment of the arrested case, that is of equal importance, and if I had the time I should like to say something about that, for the older I get the more cases I see of death coming to my patients that I could have prevented by following them up. If I had followed up the cases after I thought they were arrested, they would have lived a good many years longer than they did.

Dr. C. H. Cocke, Asheville: I agree with the last speaker that no more important subject could be presented to this body than this one. I do not wish to quibble over terms, but it is well to have in mind what you mean by the word "incipient." Personally I never use that term. It has been discarded by the National Tuberculosis Association for the very much more descriptive term "minimal tuberculosis," which I take it is what Dr. Finch had in mind. Tuberculosis is such a difficult and misunderstood subject that it is rather hard to know when its incipiency does occur; and for that reason I would much rather use the term minimal, or early, as you prefer. The fact that we are discovering these cases early is very evident in the enormous drop in the death rate of this protean disease in the last fifteen years. It has lost its first place as captain of the cohorts of death and is now down to fifth place, or seventh. When I first entered this work it had a death rate of 150 per 100,000; now it is down to 87 per 100,000. That is not only due to health campaigns but to early recognition and proper treatment in these early cases.

I am glad the last speaker emphasized the element of time for the proper diagnosis of tuberculosis, for there is no more important element than time, particularly in the diagnosis of early cases. You can not gloss over it; you can not rely upon the report of several laboratory techni-

cians which you can put together and make a diagnosis. It is not made in that way. The history, as Dr. McCain said, is of great importance. It ranks all the way from history of rheumatism or indigestion or lost weight or worry or a dozen other things up to frank hemorrhage. Let me say here that if you get a frank pulmonary hemorrhage, in the absence of mitral stenosis, assume it is pulmonary tuberculosis until you get definite evidence to the contrary. You must assume, in the absence of a definite focus from which the blood spitting can come, and in the absence of the cardiac condition of which I spoke, that it must be caused by pulmonary tuberculosis. The diagnosis is absolutely historical in the early stages. There are absolutely no positive physical signs. But to make the diagnosis you must be in the proper frame of mind and be willing to accept it tentatively, at least until you can prove something to the contrary.

I take it that the doctor's paper was intended to discuss only tuberculosis in the adult, so I shall say nothing about children.

Dr. Finch spoke about temperature, but the more important thing, to my mind, and more suggestive than the daily rise to 99.2°F. is the daily excursion as shown by temperature readings every two hours during the waking hours. Another thing is fatigability and irritability out of all proportion to the findings in the chest.

As to percussion, there are some findings that are of extreme importance. Some authorities say that the proper determination of Kronig's isthmus is of great importance, because the finding of retraction of the inner border is frequently the earliest percussion finding. Also, another point in percussion that I think is of extreme importance is the determination of the excursion of the bases, which you can confirm with the fluoroscope. If you have the patient sitting on a stool without a back and mark off the location of the bases, then have the patient take a deep breath, you will find very frequently a deviation manifested by a definite diminution of the excursion on the affected side. I should have said that in all of these examinations comparison of one side with the other is of extreme importance, particularly in inspection, as Dr. Finch emphasized. He mentioned the lag, the dragging, or droop, as well as a certain amount of muscular depression. Those things are important. Quite early you can often see other manifestations. Very often, even before a man strips, I see other things. Sometimes the pupil on one side is dilated, and we know there is disturbance of the cervical sympathetic. Finally, if you can get localized rales, you can get a pretty good idea of the pathology, particularly if you hear them in the upper regions of the chest.

As to granular breathing being pathognomonic of tuberculosis, I feel that I must take issue with the doctor's statement. It is so often heard, particularly in the second interspace, that I feel we must have other corroborative evidence.

As to the x-ray, that simply registers a certain amount of shadows or densities. These densities do not come labeled, and they come from various causes. It requires the most skilful, the most careful, and most searching investigation to properly evaluate those densities. For a man to say, after two or three weeks spent in preparation, that he can diagnose tuberculosis from the x-ray is extremely hazardous. I know nothing

more difficult than the proper interpretation of these minimal findings. Further studies of such things as beading, etc., have revised our ideas. The question of the exact picture of the normal chest is still unsettled, and you have to study these things for years before you should be willing to give an absolute diagnosis. Of course, don't for a moment think that I am decrying the use of the x-ray. I use it every day and could not get along without it. It is a very valuable aid, but it is not a ready-made diagnosis, not a diagnosis that he who runs may read. It is a difficult thing, and I think you ought to approach it with an open mind and be prepared to study.

There are other methods of diagnosis, such as blood count, complement fixation, various specific tests, etc. The tuberculin test, the doctor has well pointed out, is only an index of tuberculous infection; it does not mean, necessarily, tuberculous disease. So how are you going to make a diagnosis? First, get the most complete, painstaking, and thorough history you can take, going back to all possible points of contact, to the man's daily life, his habits. Then come the physical examination and the laboratory tests and the summation of the possibilities. Then determine whether the man is entitled to further observation to make a proper diagnosis.

In my experience, one of the chief reasons why tuberculosis has not been found in many cases is that it has not been looked for. Why should you hesitate any more to call in a man who has specialized in this disease than you do in calling in a surgeon for disease in the abdomen? Tuberculosis is just as important as disease in the abdomen, and the patient is entitled to all the information that can be obtained.

Dr. G. Canby Robinson, Dean Vanderbilt University Medical School, Nashville, Tenn., (being invited to discuss the papers): Mr. Chairman, I appreciate very much the courtesy of the Society. I do not know that there is anything I can add to this discussion. There is one point, however, in the problem of the after-care of the tuberculous that I should like to emphasize; namely, a careful study of the occupation of patients that are leaving sanatoria. I have been interested for a number of years in the adjustment of patients to their occupations, and I am sure that there are a good many people (I do not know about this state, but in other states, at any rate) that leave the sanatorium without a proper appreciation of the adjustments that have to be made from the point of view of their occupation. Again, as Dr. Dickie said, it is an economic problem; but we ought to have some expert advice from the point of view of people who understand about occupations. Some years ago I made a study of occupations, particularly from the point of view of cardiac cases, and it was very illuminating. We often do not know what an occupation means. If we would study our patient on the one hand and his occupation on the other and try to adjust the occupation to the patient, I feel that we should be able to consider intelligently at least one factor in the prevention of the recurrence of the disease and in keeping the disease in an arrested state.

Dr. John H. Woodcock, Hendersonville: In early tuberculosis (and I am speaking only of early tuberculosis, long before you have any absolute rales or temperature or night sweats or any of those predominant symptoms) I think, as said by Dr. Cocke, we have irritability, we have

exhaustion, we have high pitched notes, we have prolonged expiration. This is before the appearance of rales, before there is any destruction of tissue. We also frequently have (I think this has not been mentioned) pains, particularly in the right clavicular region, and also have stomach pains. This has been my experience, and that has been the experience at Saranac Lake.

Dr. Dickie (closing the discussion): I heartily agree, of course, with everything Dr. Robinson has had to say about occupation. I should like to emphasize this one point, that the hours spent in recreation and rest are of quite as much importance as the hours of labor. If the patient is under proper medical supervision and is really an arrested case of tuberculosis, what he does in his play hours determines to a great extent whether or not he will remain well.

THE RELATION OF A YEAST TO PERNICIOUS ANEMIA

Edward Jenner Wood, B.Sc., M.D., D.T.M. (Eng.), Wilmington

In 1924, before this section, I first mentioned the belief that pernicious anemia and sprue are types of a single infection and that the evidence points strongly to a yeast as the etiological factor. In that year there were many hostile criticisms and an occasional expression of the opposite sort. Probably the most favorable in many of its aspects is recorded in the *Medical Clinics of North America* for January, 1926 (Vol. 9, No. 4, p. 895), by John H. Musser, who, working in New Orleans after Philadelphia, is introduced to sprue clinically for the first time after his wide experience in the North with essential pernicious anemia. To me his article, from a rather unique vantage ground, has been very helpful; and I commend it to any one interested in the subject generally. Many observers in widely separated points throughout the United States have corroborated the essential points: that a yeast, presumably the Monilia psilosis, occurs in the gums and in the feces of patients with pernicious anemia; that the controls, made up of all classes of people except those shown to be sufferers from pernicious anemia, generally but not always fail to show the presence of the organism in gums, in gastric contents and in the feces. Some have reported the production of hemolytic blood changes in the laboratory animals. On the other hand, some have abandoned the study because of the presence of the yeast organism in the controls. In several hundred controls, being careful that none manifested any symptoms of sprue or pernicious anemia, I have found that about 6 per cent. harbor this organism, which for the present at least must be regarded as the Monilia psilosis. For lack of time I shall not go into a consideration of the classification of this yeast, which in itself would make a lengthy communication. Suffice it to say that there seem to be many organisms of the genus Monilia which produce acid and gas in the presence of dextrose, levulose and maltose; that do not liquefy gelatine, and that in cultural appearances are indistinguishable. It is my experience that far more important than a study of the ferment reactions is a study of the biological reactions, and in that I mean the study of the changes or lack of them resulting from the intravenous inoculation of the rabbit with a *pure* culture of the organism. I shall not again go into a consideration of the problem of obtaining the

yeast bacteria-free. The yeast seems to have a surface of a sort that makes bacteria literally hug it as though it were fly paper, and how to separate the two has been no small task not yet satisfactorily solved.

In pernicious anemia the organism has been obtained in the vast majority of cases. In a series of about seventy cases it has been impossible to get a growth in four cases. In two of these four cases a positive complement fixation response has been obtained, and in the others it has not been tried. In this fixation work the antigen has been made of the yeast itself, which is autolyzed.

The yeast has been recovered from the gums and from the feces, as reported before, but the question has been raised: Is this yeast of the gums and yeast of the feces the same? Can there be any doubt that the two coming from the two different sources are one and the same? Biologically, culturally, and morphologically this problem has been studied, and it seems a justifiable conclusion that they are the same.

An attempt has been made to apply therapeutically the few facts so far gleaned about this organism. Ashford, in Porto Rico, reported many successes and relatively very few failures in the treatment of true sprue with vaccines of the Monilia psilosis. Acting on the assumption that the two conditions are identical, I have been treating pernicious anemia in the same manner. The technic of Michel, working with Ashford, was used in large part. However, it was found that a greater degree of heat was required to kill the yeast than recorded by these workers in Porto Rico. After much effort I have concluded that 80° C. for one and a half hours is a minimum to accomplish it; and I am now trying to determine whether or not, as in bacterial vaccines, there is any loss by a longer exposure to this heat. Yeast vaccines become contaminated in a surprisingly easy manner in spite of the preservative and require frequent cultural tests to determine whether or not they remain sterile. For this reason the vaccine is sent out in very small amounts at a time. The vaccine is a one per cent. suspension in normal salt solution to which trikresol is added as a preservative.

Only twelve cases treated with vaccines can be reported today. Of the twelve improvement has been noted in ten. This improvement has consisted of a gradual but quite perceptible improvement in the blood picture. In the two in which improvement has not been noted it has been impossible to obtain the organism. In both mixed stock vaccines of the Monilia psilosis have been used. In one of these two there seemed to occur temporary improvement, but it was impossible to sustain it for any length of time.

An effort has been put forth not to be beguiled by the enthusiastic report of the patient, who should be regarded as the recipient of intensive suggestive therapeutics. No class of case, excluding the phthisical, can be so optimistic or so readily respond to any new idea or treatment. Therefore the report that there is a great decrease in the numbness, tingling and other sensory symptoms which are a part of the early cord changes should be taken with a grain of salt. The fact remains that such reports are frequently received. The one encouraging observation is the very gradual but persistent increase in the hemoglobin and in the red blood count. In some cases the treatment has been begun soon after transfusion, and by a comparison with numerous previ-

ous transfusions it seemed justifiable to believe that the effect of the vaccine was to assist in holding the blood; and one is tempted to believe that there is an inhibition of the hemolytic process. But before this is accepted there must be more evidence. At times there seemed to be grounds for believing that the remission was hastened. At all times effort was made not to interpret improvement after the vaccine as early signs of remission. On the other hand, there did at times appear to be justified the opinion that the treatment had precipitated that much hoped for state.

No claim is made that the vaccine will cure pernicious anemia, but there is evidence that the autogenous vaccine will accomplish in pernicious anemia as much as it has accomplished in sprue as claimed by Ashford. If this is proven to be correct there is still full justification for using it, and all the more so in the absence of anything better. If nothing more is accomplished than a decrease in the number of transfusions, as seems to have been done, it will justify itself, but it must never for a moment be thought to be sufficient reason for the postponement of transfusions. If it influences transfusion at all it is in the other direction. The safe procedure would be to give the transfusion and make the attempt to hold the cells by the vaccine.

Much must be done in an experimental way before the vaccine of the yeast is perfected. Doubtless the technic of bacterial vaccine production has reached an advanced degree of perfection, but few if any other yeast vaccines are being used. The therapeutic action of this new class of vaccines seems to be different, and the one unfavorably inclined to vaccines generally should try this before condemning it. My own feeling is that its action is much more certain and decided.

DISCUSSION

Dr. Reuben McBrayer, Shelby: There is one thing that all of us can do, and that is help hold up Dr. Wood's hands, whether we agree with him or whether we do not. I do not know just how much clinical material he has but certainly from his own office only a limited amount, so all the men near him could aid him. Another thing: I am certain that Dr. Wood will be glad to help any one of us (no matter how far away) ferret out any cases of this particular type.

The Walter Reed Hospital workers report that they are getting normal blood calcium in pernicious anemia and in sprue they are getting decreased blood calcium. I should like to ask Dr. Wood what he can say about that; whether they are probably incorrect, or what bearing it may have on the two conditions.

Dr. F. R. Taylor, High Point: I do not know anything about sprue from personal experience, but I am always tremendously interested in and attracted by anything Dr. Wood has to say. I think he is one of the foremost research workers we have in the state and a man who, when he says anything, says something well worth while and well worth remembering. The last time I heard him talk about this I asked him a question which at that time seemed to be under debate: that is, how much the presence or absence of hydrochloric acid has to do with the diagnosis of pernicious anemia. Could you have pernicious anemia in the presence of free hydrochloric acid in the stomach?

I should like to ask if any recent work has helped to clear up this matter. There is another question I want to ask, but not with any idea of criticism. Some writers have advocated certain dietary treatments for sprue, and I should like to ask Dr. Wood whether the same dietary treatments as advocated for sprue (the high sugar diet, fruit diet, or what you will) seem to have any effect in pernicious anemia.

Dr. Wood (closing the discussion): I want to thank Dr. McBrayer for mentioning the fact that, working as all of us do in North Carolina, which might be called a rural state, clinical material in any one field is not as easily had as it is in the centers where there are large wards to draw from. I should like to repeat what he has suggested, that I should be delighted to get specimens of feces from pernicious anemia or cases that are suggestive of pernicious anemia.

The question of the blood calcium is one that I took up immediately after the meeting in May a year ago of the American Society of Tropical Medicine, where the question was thoroughly threshed out. I should like to say with a good deal of positiveness that the blood calcium level in sprue is a most variable thing; and, far from being helpful in drawing a distinction between sprue and pernicious anemia, we get absolutely no possible help. The determinations in my cases were very carefully done; but we found time after time, from day to day, that the blood calcium level in sprue and in pernicious anemia varied just as much as it did in the normal individual. In the present time of great laboratory effort we are losing sight of the value of careful bedside observation. If any of you will take the trouble to read Addison's original account and Biermer's original account, you will find that many of those cases presented diarrhea. In other words, in many cases you find diarrhea in pernicious anemia, as in sprue, and also a glossitis in pernicious anemia indistinguishable from the glossitis of sprue. Sprue and pernicious anemia merge so completely into one another that it is no uncommon thing for a patient whom I diagnosed fifteen years ago as having sprue to come back now to one of my colleagues and a diagnosis of pernicious anemia be made.

Dr. Taylor was very kind; far kinder than I deserve.

The question of diagnosis of pernicious anemia is one that varies somewhat geographically. I think no one in this country would be willing to make a diagnosis of pernicious anemia in the absence of achylia gastrica. The question of achylia in sprue is the one great fundamental point of distinction between the two diseases, and it is a crucial point. The type that assumes the sprue manifestation will be the type in which the mouth and the small intestines will be involved. The type of this condition which manifests itself in what we know as pernicious anemia is the type that, as a rule, attacks the stomach and the nervous system. The presence or absence of free hydrochloric acid in sprue is one about which you can get all sorts of diverse opinions. I have found cases of sprue that would go for months with what seemed to be true achylia (i.e., absence of free hydrochloric acid); and then, with improvement, I have seen the achylia disappear and the free hydrochloric acid reappear.

About the diet Dr. Taylor mentioned. I had a letter just a few weeks ago from Dr. J. S. McLester of Birmingham, Alabama. He said he had been feeding his pernicious anemia patients strawberries with success. Those of you familiar with sprue will remember that one of

Sir Patrick Manson's great contributions to sprue was the feeding of his sprue patients with strawberries and milk. I have heard it said that in California when a patient is suspected of having sprue strawberries were given; and if the therapeutic test was positive—that is, if the patient improved on the strawberry diet—a diagnosis of sprue was made; if he did not improve, the diagnosis of sprue was rejected.

CIRCULAR INSANITY

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The title of this paper was selected because of its brevity, and because it is the best simple descriptive title of the most typical form of the great classification of mental disorders known as manic-depressive psychosis. For the purposes of this paper circular insanity and manic-depressive psychosis are used as interchangeable terms, although in a more complete consideration of the subject the term circular insanity is used as one of the types of the general manic-depressive group.

It was Kraeplin who first showed that the symptom groups which for years had been known as melancholia and mania are more or less related. In his wide experience with a large number of cases he had observed that in the same patient at one time he found mania and at another time melancholia; and that a careful study of the cases supposed to be one or the other of these groups showed that the symptoms of both were present at some time, although one or the other, either mania or melancholia, usually predominated. He found in other cases that there was a sequence of symptoms characterized by excitement, depression, and a period of mental health, which he terms circular insanity. No form of mental disorder offers so broad a field for study. Few people are absolutely normal; many people running a cycle varying from depression to excitement or exaltation, differing from circular psychosis in degree and duration but probably not in kind. Our subject embraces a study in normal psychology as well as abnormal psychology. Circular insanity contemplates the highly efficient, excessively active types in all degrees of pronouncement in steps until we strike a period of normal; and it includes the downward curve until it embraces types of depression and utter inactivity to the extent of complete mental and physical invalidism. Doubtless some of you can recall friends, or types of some people you have known, who for a certain period are very active and efficient and prominent in the affairs of the community; but at some later time they are also sluggish and inefficient, and difficulty is found in securing their assistance in carrying forward new enterprises. When studied in its simplest form the manic-depressive reaction does not seem to be so much a special disease or pathological process as an exaggeration of experience belonging to our normal life. In normal life we find we have variations in emotional reactions and variations in efficiency and capacity. These changes, though not pronounced and only faintly developed in the normal, seem to be a part of our normal experiences. When these fluctations in activity become sufficiently pronounced as to attract attention, we say that the individual is queer or slightly an abnormal person; and from these unstable individuals, who show only slight constitutional variations, it seems only a step in transition to the mildest types of manic-depressive psychosis. When these variations in

conduct and these waves of emotional reactions become so pronounced as to come in conflict with the ordinary rules of social conduct or violate the accepted laws of society we have the frankly insane.

Definition: Kraeplin defined manic-depressive insanity as "characterized by the occurrence of groups of mental symptoms throughout the life of the individual not leading to mental deterioration." These symptom groups are termed the manic, the depressive, and the mixed phases of the disease. The manic phase is characterized by psychomotor excitement, with pressure of activity, flight of ideas, and unstable emotional attitude. In the depressive phase we have psychomotor retardation, poverty of ideas, and depressed emotional attitude. The mixed phases comprise combinations of the symptoms characteristic of the manic and depressive phases.

Causes: Circular insanity is a large group, embracing from 10 to 20 per cent of all the insane. The last United States census report showed 40,751 manic-depressive patients in hospitals for mental diseases. Of the causes, the leading authorities give about 80 per cent. in which an hereditary taint may be traced. It is a malady usually found in the third decade of life. It is more frequent in the female, some authorities giving the ratio as two to one. External influences play a very small part, as compared to morbid predisposition, in the causation of manic-depressive insanity. Alcoholism may be mentioned but is regarded more often as a consequence of the excitement or depression and not as a cause. As to bodily illnesses which may be associated with an attack of manic-depressive insanity, they are believed to be merely a coincidence of association rather than a causative factor. Kraeplin found in his study of cases supposed to be due to bodily illnesses that in practically all there could be found an attack of a similar psychosis previously, or an attack had followed later, without the associated external physical or bodily illness. Unfortunately, some authorities on internal medicine continue to give physical diseases as a cause of circular insanity. This may arise from some knowledge or observation of value; but in my opinion more likely it arises from the failure to differentiate between the delirium sometimes associated with infectious diseases and the excitement we have in circular insanity, on the one hand, and the failure to differentiate between confusion in infectious diseases and the retardation and depression characteristic of the depressive phase of manic-depressive psychosis. Psychic influences (such as the strain and stress associated with the illness or the death of a near relative, an operation, a pregnancy) are given by some authorities as causes, but the weight of evidence seems to be that these outbreaks are usually with those who have the hereditary predisposition. Causes such as quarrels with neighbors or relatives, law suits, lovers' disputes, unrequited love, infidelity, financial difficulties and sexual indiscretions are sometimes cited; but of a large number of cases whose attacks were traced back to such causes, most were found to have had similar attacks of psychosis. We all know of cases of depression that seem to follow financial reverses; but in most of these cases it could be found that there has been a similar attack previously, or later in life another attack is likely to recur without the financial reverses to cause it. There are cases of melancholia supposed to be due to financial reverses; but when financial affairs are set aright again it

has no influence on the disease, and later these cases have manic-depressive attacks without these external causes. More and more we are led to the opinion that the cause of this malady must be sought in internal changes; and our utter inability to effect a cure of these cases by any external measures is very convincing that the attack of circular insanity must be, to a large extent, independent of external influences.

Symptoms: Apprehension is disturbed, showing itself in the great distractability of attention. Consciousness is clouded, so that at the height of the manic excitement the hazy impressions lead to disorientation. There may be hallucinations, the usual type being hypochondriacal fears, the patients thinking they can feel their veins or their organs undergoing changes or moving about. The memory is not greatly injured, often being very acute, apparently; but the memory of events of an individual attack is usually indistinct if the attack has been one of pronounced excitement or deep stupor. There may be many delusions. In the manic phase they are expansive; there are joking boasts and exaggerations, often delusions of jealousy and poisoning. In the depressive phase the somatic ideas are often prominent, with delusions of self accusations and persecution. These patients usually have some insight; they may remember a former attack; but especially in the depressive phases, they insist that the present attack is much worse and hopeless. The disturbance of thought is a pronounced symptom. In the manic phase there is incoherence, rapid succession of ideas, giving rise to the so-called flight of ideas. There is an abundance of words without sequence of thought. In the manic forms the emotional attitude is that of well-being, showing itself in expressions of happiness and joking and silly remarks. There may be irritability, with outbursts of anger without adequate cause. In the depressive states the emotional attitude is that of despair and great anxiety. The patient shows no interest in things. There is no judgment as to the relative value of circumstances around him. The observation of grief does not cause a similar reaction in these cases, nor does the observation of joy produce joy as it would in normal life. In the psychomotor sphere there is great activity in the manic phases; these patients seem to be under intense motor excitement or great pressure of activity. On the contrary, in the depressive forms there is retardation of activity. All actions are performed slowly; the ordinary movements, such as walking and talking, are performed without energy and very slowly. In some cases this retardation amounts to a condition of stupor in which the patient is confined to bed without the ability to care for his ordinary physical needs. In the mixed phases all of the foregoing symptoms may appear in different degrees, and alternating from time to time. Of the physical symptoms, the loss of body weight, disorders of general nourishment, and disturbance of sleep are the more important. The appetite is variable and requires guidance. In the manic phase it may be morbidly excessive. In the depressed phase there is often no appetite and forced feeding is required.

Diagnosis: The diagnosis of manic-depressive insanity is based primarily upon the recurrence of attacks, the family history of morbid neuropathy, and the marked tendency to recurrence and recovery without mental deterioration. The course of the malady is variable, varying

from a few weeks to five years or more. The usual duration of an ordinary typical case, other things being equal, in the majority of cases is from six months to one year.

Prognosis: For the individual attack the prognosis of manic-depressive insanity is favorable. Recovery from manic excitement has long been considered good. Recurrence of attacks is the rule and is one of the outstanding characteristics of the disorder.

Treatment: With the cause of manic-depressive insanity so deep-rooted in the personality, there is little prospect of results in preventive treatment. Those liable to attacks should lead an even life, avoiding alcohol, because it adds especially to the possible indiscretions of conduct; and avoiding the strains and stresses of life, though useful employment is advisable. The disease comes we know not why, and runs its course in spite of our efforts to influence it. There is much that may be done, however, for the unfortunate victim during an attack. Among these may be mentioned especially nourishment. The body weight should be carefully watched. Regular meals of a full well-balanced diet should be kept up; resorting to a stomach tube, using an abundance of milk and eggs, with fruit and vegetable juices, when food is refused. In the depressed cases, great caution must be exercised to prevent suicide. This presents great difficulties. It is usually necessary to render some assistance to secure sleep, and protection against exhaustion is important. In the manic phase many patients need protection against indiscreet conduct, usually requiring a forceful attendant or nurse; and often institution care is advisable.

Recovery may be considered accomplished when the patient has acquired a calm quiet mood, has ceased the usual impatient urging and shows good insight; when nourishment, as shown by body weight, has returned to normal and the sleep is undisturbed.

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THE INFLUENCE OF THE MIND IN FUNCTIONAL AND ORGANIC DISEASES

OR THE PSYCHOLOGICAL PRINCIPLES UNDERLYING ALL HEALING PROCESSES OF THE HUMAN BODY.

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To single out this as the psychological moment in the era of evolutionary progress through which we are now passing would be hazardous, to say the least; but I am loath to believe that there is a thinking man in this audience who does not dimly sense the dawning of a new era in the evolution of the race. The signs of the times must be evident to you all. Psychology, formerly of interest only in the class room and to a small group of psychiatrists, has now been carried to the general public and is being applied to the conduct of human affairs in all their phases and particularly in our own special field in the care and cure of human ailments. As one writer says: "The revelation of the subconscious mind and its hitherto unknown powers will, in ages to come, be recognized as the supreme achievement of the twentieth century, if not the supreme achievement of all ages."

Why should not the medical profession as a whole grasp the significance of this psychological movement, now apparently appreciated only by a handful of psychologists and psychiatrists but being eagerly grasped by the laity and unconsciously used by the innumerable bodies of cults swarming over the country and undertaking the treatment of disease? So I am hoping that it may prove both interesting and stimulating to the profession to review the remarkable influence of this mysterious and all powerful psychological factor in the field of our daily activities.

While I have been interested in this and allied subjects for many years, the popularity of psychological lectures and mail order courses in healing without medicine or doctor, together with the revival in the churches of the admonition given by Christ to His disciples to go out and heal the sick by the laying on of hands and prayer, induced me to study the subject again more closely.

The method of conscious autosuggestion as used by Coué, the optimistic little pharmacist of Nancy, seems to be the only one resting upon a scientific basis and being free from any religious or other extraneous attachments. Medicine, as well as humanity in general, is deeply indebted to one French chemist, Pasteur, so possibly Coué may also render some service by bringing this simple method of psychotherapy to our notice. As all doctors admit without hesitation that they use suggestion in their practice either consciously or unconsciously, I can see nothing fundamentally antagonistic to the orthodox teachings of medicine and surgery in the conscious employment of suggestion in any of its numerous forms. Furthermore, I hope to show that it can and ought to be studied without prejudice from a purely biological point of view. Superficially viewed these methods of suggestion would seem to offer a ridiculously simple panacea to all the ills to which human flesh is heir; but upon careful investigation and study they seem rather to reveal a most efficient therapeutic agent which Dame Nature has thoughtfully provided for every living creature, the value of which scientific medicine fails to appreciate and

utilize except in the most homeopathic of doses. The deeper one delves into the mysteries of the human mind and body, the firmer this conviction grows.

In the worry and stress of professional life I am inclined to think that few doctors give any serious thought to the subject, though it strikes at the very heart of medical practice. The subject is such a far reaching one that in the time allowed it can be but barely touched upon; but I think I can show to any unprejudiced mind and to one who has kept in touch with the psychological advances of our times that it is neither a foolish nor a dangerous method, as many eminent physicians seem to think; but that it appears to rest upon true laws governing that psychological principle or primary cause underlying all creative, preservative, and reparative processes of the human body—the subconscious mind. At the outset I want to stress the point that I am not interested in any particular method or system of mind cure, healing by prayer, Christian Science, New Thought or other cults but want to draw your attention to the powerful influence the mind has over the physical processes of the body. The proof of this powerful inherent energy or force cannot be gone over now; but all scientists admit as a fact that the sum of knowledge now possessed by man of all physiological processes makes the admission of some psycho-dynamic force necessary, call it what you will. I shall not burden you by a recital of the wonderful powers and activities of the subconscious mind, for it is now household knowledge; and popular lectures and correspondence courses are being attended by all classes of people. While this is true of the laity, most of the profession seem to regard it more as a scientific fairy tale, interesting if true, but having little if anything to do with the practice of medicine in their daily rounds.

To facilitate the logical discussion of the subject it seems advisable to review the commonly accepted hypotheses upon which all systems and methods of affecting the body through the mind are founded, not attempting to establish their truth, which I think is now generally accepted, with possibly some reservations by the "bitter enders" of materialism.

1. That man is endowed with a dual mind, the conscious and subconscious, or one mind with two distinct phases of activity or states of consciousness.

2. The human body is a confederation of individual cells, each one being endowed with an intelligence commensurate with the function it performs, and all being controlled by a central intelligence, acting through the nervous system by means of a mental force or energy.

3. The subconscious mind controls all functions, sensations and conditions of the body. It is endowed with immense intelligence and creative power. It possesses instinct or intuition of bodily needs, knows what to do in emergencies, and acts with a rapidity and skill that the conscious mind has never attained. It is the builder and renewer of the body.

4. The subconscious mind is credulous and is amenable to suggestion. This is simply the bare statement of the facts that have been established by the study of the mind aided largely by hypnosis. Since these

important discoveries have been brought out constant effort has been made to find some simple and practical method by which this wonderful inherent force or energy can be consciously controlled and stimulated to increased effort along any lines desired, either specific or general. Strange to say, the medical profession as a whole has shown little interest in these efforts but has confined itself almost exclusively to the use of drugs and physical measures to stimulate this psychodynamic force.

We are accustomed to think of our will, or will power, as a determining factor in our lives; but the fact is the will only directs our conscious mind but cannot influence the subconscious mind directly, but only through suggestion or by courtesy of the subconscious. A suggestion has no dynamic force in itself and may or may not be accepted by the subconscious. A suggestion, to be accepted and subsequently materialized, must be assimilated by the subconscious, thus becoming an autosuggestion. An autosuggestion, then, is an idea implanted in oneself by oneself, which idea, be it good or bad, is then faithfully carried out and materialized by the subconscious to the best of its ability. That this is possible is due to two fundamental laws of the subconscious:

1. It is impossible to think of two things at the same time. Two ideas may be in juxtaposition, but they cannot be superimposed in our minds.

2. Every thought or idea entirely filling our minds (an accepted or assimilated suggestion) becomes true for us and tends to transform itself into action; that is, the subconscious immediately begins to make the idea or belief a reality (shown on hypnosis).

These being the immutable laws governing the subconscious, it becomes inevitable that if you can make a sick person believe he is getting better the subconscious (being credulous) accepts the idea or suggestion as being true and not only believes it but immediately starts to work to materialize the belief by repairing any functional or organic derangement to the best of its ability.

There are three points I want to stress at the beginning of our discussion of mental therapeutics.

1. It is not a religion, and it works just as well in sinners as in saints, although religious emotion is a powerful psychodynamic stimulant.

2. It is not supernatural and breaks no law of nature.

3. No power outside the body has anything to do with the healing processes within.

The conceptions of this subconscious mind to which I particularly wish to call your attention, and which you may not have thought of in this light, are:

1. Its relation to the so-called "laws of nature." These laws of life, growth, repair, reproduction, etc., we think of as having been laid down in the beginning by God or Nature, and in some mysterious way operating like a seventy-year clock until accident or old age stops them. God, or the maker of the laws, having set them in operation, is generally thought of as having retired to some great distance and paying no further attention to them nor to our prayerful appeals to modify these

laws when we think them painful or unjust. The important point to remember is that not only are the laws operative in all living processes; but that the operator (God or Nature) in the form of a mind, soul, spirit or psychodynamic force which is all-wise and all-powerful, is inherent in them; and more important still, as soon as we have mastered the principles underlying these laws we can summon to our aid this inerrant wisdom and power when needed, as it was evidently intended that we should. To any who may think I am overstating the influence of the subconscious I might quote what that eminent Scotch scientist, J. Arthur Thompson, says in his recent book "What is Man?" "It does not seem possible to make sense of our mental life unless we utilize the concept of the subconscious mind."

2. The second conception of this psychodynamic force of subconscious mind that I want to leave with you is that its most important characteristic is its creative ability and, furthermore, that it creates by thought power. Whether a thought, an idea or a mental picture which reaches the subconscious is dynamic itself or whether it furnishes the necessary stimulant to the psychodynamic force is immaterial. The result is the same; that is, the thought, wish, idea or mental picture becomes materialized. This may be a hard conception to grasp but really no harder than the electron, ether, or other scientific theory.

If the science of medicine is to advance, the future doctor will have to know more about the power of thought over our organs and functions; he will have to recognize the stupendous fact that within ourselves resides the greatest and only curative principle and, more important still, the fact that this force can be consciously directed. Ignorance can no longer be elevated to the dignity of skepticism. In this light the method of conscious autosuggestion does not appear so foolish after all but becomes a simple means of evoking the immediate and continual aid, in times of physical, mental and moral stress, of this intelligent force inherent in every living creature. There is nothing new or revolutionary in the assumption of this force, from the fact that the father of medicine himself recognized and named it "Vis medicatrix naturae," which modern science has changed to "defensive forces of the body," or "adaptive potentialities." The recognition of this mental or vital force brings on again that ancient controversy, "Vitalism vs. Materialism," and you must accept one or the other.

I see no other way of escape except it be not to think at all, which, of course, is the easiest way and I regret to say the popular way with most of us. But as the object of this paper is to stimulate thought, I am going to try to force a decision upon you. If you are a materialist and believe that "man is only a few pailfuls of water and a handful of ash" or, stated in more scientific detail, *fat* enough for seven bars of soap, *iron* enough for a medium sized nail, *sugar* enough to fill a shaker, *lime* enough to whitewash a chicken coop, *phosphorus* enough to tip several boxes of matches, *potassium* enough to explode a toy cannon, *sulphur* enough to rid a dog of fleas, with about twelve gallons of artificial sea water to keep them in solution, all of which materials are worth, at the present high cost of living, about 98 cents, that is your privilege. If you can believe that thought, love, anger, patriotism, altruism and all the emo-

tions that surge through and govern the actions of a living, throbbing human personality can, by some mysterious reaction or chance collocation of chemical elements, be evolved from that 98 cents worth of inorganic matter, the outlook for the further advance of our civilization can hardly be called brilliant.

An indication that the influence of mind on the functions of the body is gradually being brought to the attention of the profession is shown in a paper by Dr. Wm. A. White, of Washington, entitled "The Message of Psychiatry to General Medicine." The point he makes is that man should be studied as a whole, as a unity, rather than as a problem of physiology alone. He says: "As the bodily structure of man can be traced back in uninterrupted series to the simple ameba, so the Psyche of man can be traced to similar simple origins. It means, in short, that the Psyche is as old as the Soma; that in the very beginning of life the foundations were laid down that later developed into man with the twofold aspect of body and mind; it means that psychology, quite as truly as physiology, is a biological science. This concept that the histories of the Psyche and Soma are contemporaneous, that mind and body as such are but different aspects of life itself, is, I believe, the most pregnant concept which psychiatry has come to realize and which it is slowly forcing to be generally recognized. Its significance for general medicine lies in the fact that almost wholly medicine is occupied with the problems of the body, the Soma; and it has devolved upon psychiatry to point out the one-sidedness and consequent danger of this restricted point of view. Is it not time that mind should have a place in the physician's consideration of his patient every whit as important as his body?" If it be true, as Dr. White says, that "The Psyche is as old as the Soma," it would seem to supply the "missing link" sought by Professor Osborne, who says: "The spiritual qualities of man cannot be accounted for by purely evolutionary processes; and all psychic faculties of man are new attributes to the human race, without organic antecedents and not to be accounted for by evolution." The psychic faculties of man, by their very nature, could not leave any "record in the rocks" as have his organic characteristics, so must be sought in the realm of the mind. In this light what tremendous import the subject assumes both to science and religion!

Did time permit I could show you from the writings of many prominent psychiatrists and neurologists—in fact, every kind of practitioner—that they regard the influence of the mind both in the cause and cure of diseases of the body as a most important factor. That bodily reactions are affected by mental stimuli has been scientifically proven beyond all doubt. Pawlow has proved by actual experiment that the mere showing of a whip to a dog suppressed the flow of gastric juice, thus demonstrating the power of the thought of punishment to inhibit the flow of gastric juice. Luckhardt and Johnson, Johns Hopkins (*American Journal of Physiology,* September, 1924), experimenting along the same lines, found that suggestion of a test-meal under hypnosis causes a "secretion curve with acidities equally high as when the test-meal is actually given."

Crile and Cannon have shown that the emotions of fright and worry will exhaust the adrenal glands, while it is well known that anger will affect the sugar content of the diabetic. It must have been the clinical observation of all of you that these subtle emotions, hate, anger, fear,

worry, grief, affect the body through the mind and are disturbing, harmful and destructive influences; while joy, love, hope, etc., are stimulating, energizing and constructive influences. Physics and chemistry have been of great assistance in adding to our knowledge of the workings of the human body, but as the evolutionary processes advance they become insufficient to satisfy, so biology and psychology must be called in. Biological knowledge gives human nature the promise of control over itself. "Hate and fear breed a poison in the blood which, if continued, affects eyes, ears, nose and the organs of digestion. Therefore it is not wise to hear the unkind things that others may say of us." (Pythagoras.) We thought Dr. Cannon's observations and experiments in regard to the influence of emotions on bodily functions were original, but Pythagoras seems to have outdated him by some years.

Now, let us consider for a moment what the authorities of medicine (for many doctors do little thinking of their own and are strong for authority), from Father Hippocrates down to the Mayos, think of the reparative powers of nature, "vis medicatrix naturae" or the modern subconscious mind. All the teachings of Hippocrates center in the aphorism, "Nature the healer of our disease," which means nothing if not a psychodynamic force within our bodies. Galen said, "When the imagination of a sick man has been struck with the idea of a remedy, which of itself is without efficacy, it becomes endowed with beneficial powers." See how closely our great Osler followed these ancient masters. "The psychical method has always played an important though unrecognized part in therapeutics. It is from faith, which buoys up the spirits, sets the blood freely flowing and the nerves playing their part without disturbance, that a large part of the cure arises. The basis of the entire profession of medicine is faith in the doctor, his drugs and his methods." Harvey Cushing in a recent address said: "It is an old saying that 'The wisest physician is he who knows the uselessness of most drugs.' The acknowledged self-limitation of many diseases, followed by the success of homeopathy and later by Eddyism and now by Couéism and healing by prayer, is slowly forcing upon the profession the therapeutic importance of a long neglected force widely employed in Aesculapian temples, the influence of mind upon bodily ailments, particularly those so-called neuroses which comprise such a large part of human ailments."

W. J. Mayo, in an editorial entitled "Apprehension," said: "Because *thought* cannot be measured and weighed it is regarded as non-existent and immaterial. It has been said that apprehension not justified by the event is the cause of three-fourths of the sorrow and tribulation of the world. The three greatest enemies of the human race are tuberculosis, cancer, and the so-called neuroses." Dr. Cabot has said that out of three hundred diseases drugs cured twenty-eight and Nature the rest. Dr. W. J. Mayo at another time (A.M.A. 1/27/23), in speaking of tuberculosis, said in effect that the bacteria are more resistant to medication than the human organism itself and if a cure is effected it is through self-engendered immunizing substances. If that is so in regard to tuberculosis, it is a natural inference that the remaining 271 diseases are cured by the same means, so it ill becomes us to neglect any clue that may lead us to Nature's secret of the *modus operandi* of this mysterious manufacturer of these all important immunizing substances within us. The terrible

increase of cancer is familiar to you all. The master minds of the profession are diligently working to find the cause and cure. Dr. Luden of the Mayo Clinic, in a paper entitled "Progress in Cancer Research," says: "The complete and spontaneous regression of inoperable malignant tumors in 100 well authenticated cases is conclusive evidence that the human body can wage a winning war against malignancy." This report of Dr. Luden's seems to be further substantiated by Dr. O. Strauss, of Berlin, who is appealing to all physicians to aid him in completing and studying instances of the spontaneous cure of malignant diseases. (*A. M. A. Journal.*) McCarty, also of the Mayo Clinic, in an article on cancer says: "My observations have revealed a biological reaction which is malignant only in so far as it destroys the communistic organization of the cells. In fact, many biologists are of the opinion that exposure of living matter to destructive factors has led to adaptive potentialities that are factors of safety in the structure and functions of all forms of life, and Nature has been just as efficient in her defensive preparations as in the construction of the human body." Dr. Blair Bell's recent views on cancer must likewise be based upon the intelligence of the cells, for he says: "If in the mature life of a group of cells there comes again a time when they are involved in a struggle for existence they revert to their embryonic type, when they ate into the maternal tissues. Thus cells may be thought of as *retaining memories* of their earliest life, when their struggle for existence had just started and was at its keenest—a biological atavism or throwback." Does not all of this plainly imply intelligence in the living cells? Can you conceive of anything without intelligence having a communistic organization or putting up any kind of defense, to say nothing of memory? It simply means that life and mind are inseparable; life is mind, and the essential characteristic of a cell is that it is a *mind organism.*

Now I have quoted Dr. Mayo as saying that if a case of tuberculosis is cured it is by means of self-engendered immunizing substances. Dr. Luden says the human body can wage a winning fight against cancer and proves it by 100 cases of complete and spontaneous regression of inoperable malignant tumors. All psychologists admit that the so-called neuroses, last of the deadly trio, can only be successfully treated through the mind. Here, then, we have the three greatest enemies of the human race—tuberculosis, cancer, and the neuroses—admittedly mastered by this mysterious psychodynamic force inherent in every living creature. Isn't it time we dropped the attitude of ridicule and supercilious disdain and do some scientific orientation into primary causes instead of continually fussing with end results? How long is the profession going to ignore this remarkable and admittedly effective therapeutic influence constantly suggested to them by the most eminent men all through the history of medicine and either through prejudice, perverseness, or preconceived ideas (for it cannot be due to ignorance) continue to disregard it? Does it not appear to be a good working hypothesis to assume that this psychodynamic force or subconscious mind is the same agent through which all healing throughout the human body is brought about, whether it be faith in the doctor, his drugs or his methods, as suggested by Osler; the grotto of Lourdes; the bone of St. Anne; so-called Christian Science; the tom-tom of the Indian doctor; the manipulations of our drugless

cults; or healing by prayer? Is it not evident that the healing of disease and the perpetuation of life itself are only a difference of degree and not of kind? I would not insult your intelligence by suggesting for a moment that God or Nature uses different methods and laws of healing for different races, religious creeds, sects or cults.

I could quote you any number of references to the influence of the subconscious mind in the body, but you all know it; only you will not take it seriously or think along the lines of primary causes. Before leaving this part of the subject let me draw your attention to a few interesting incidents in the lower animals, showing the wonderful power of the subconscious mind in them and how they make use of it in their daily activities. You are probably familiar with the experiments of Dr. Paul Kammerer with salamanders; how he shows that they can change the color of their backs to suit the changing background, a bit of protective camouflage not excelled by human minds in the late war. Another interesting exhibition of the power of the subconscious mind to accurately create the mental picture made by the conscious mind is shown in the cuckoo—the "flapper" of bird society. As you know, she builds no nest nor does she hatch out any eggs, but she is a practical psychologist. She watches her chance and, when some mother bird leaves her nest gives that nest of eggs a careful "once over," noting their size, color, and markings. She makes a mental picture of them, turns it over to her subconscious mind, and then proceeds to lay an egg so identical in every respect that when she puts it in the other bird's nest it is hatched out with her own—some bird, I'll say. This instance seems even more remarkable from the fact that it is not a protective measure but shows a cleverness in avoiding household duties that would be a credit to the modern flapper. Nature is replete with instances of this inherent psychodynamism and cell intelligence. This view has been scientifically confirmed only recently by Professor Osborne, who formulates two new laws from the "record of the rocks" or the interpretation of fossils: (1) That every animal fits itself to new modes of life by modifying its own structure and activities from generation to generation. (2) That these characters *from the beginning* take a course directed towards their future fitness. If this means anything, it means that the "divinity which shapes our ends" is within us—a psychodynamic force, and furthermore that its actions are intelligent and purposeful. Man is now the highest expression of nature and has attained this position by the unconscious workings of the evolutionary forces rather than by any conscious effort on his part. Personally I feel sure that man is destined to evolve to a much higher plane, but this can only be accomplished by his conscious wish and desire and brought about by his coöperation and understanding of the laws of his psychic nature and the intelligent application of those laws. This view is also sustained by J. Arthur Thompson in "What is Man?" already quoted, in which he says in conclusion: "Science does not look for marked changes in man's bodily structure but sees no reason to think that his brain has reached the end of its evolution, as there are many areas for which we have found no use as yet. Nature may not work great changes in man, but he is now in position to work great changes in himself."

While this thought (the further evolution of the brain) is not strictly germane to my subject of the healing powers of the mind, still it opens up

such a fascinating vista of the tremendous possibilities towards the onward and upward progress of the race that I beg your indulgence a few moments more just to touch upon it. This line of thought is bringing out the astonishing fact that the ability of the mind to heal bodily ailments is a very small affair compared to the unlimited possibilities of its wonderful creative faculty in every condition of life. That same mental or psychic force which has raised the Monera to man in his evolutionary journey is the same force that will eventually evolve man to immortality. In human evolution from now on a new and higher factor may be added, which is the conscious voluntary coöperation of the human psyche in the work of its own evolution through our understanding and intelligent application of these laws of the subconscious mind. The method is the same; the thought, the wish, the ideal implanted in the subconscious will stimulate those all powerful, all wise powers and by the laws of its nature will proceed to materialize them. (It is a revolutionary thought and you may balk at it, but did you ever consider that the distinguishing characteristics of all living things have come as a result of a desire, a wish, an ideal for those characteristics? Any wish or desire intense and persistent enough to reach the subconscious has always been fulfilled.) (Duck—ape). In Biblical terms this is called faith; scientifically it is psychodynamic force. The name is immaterial; the point to grasp is that it is our most powerful human faculty—projective, dynamic thought which grips the unseen and pulls it into actual expression. Nothing can resist it. We have this power within us, this psychodynamism; and all we need is the wish, desire and persistence to call it into action. It is a biological law and works with the inerrancy of all biological laws. As Dr. Roy Wilbur, ex-president of the American Medical Association, says, the rules of biology work all the time. They are as sure as the rules that control electricity and falling bodies. The duty of medicine is to learn the rules and help man to meet them. History is full of the biological mistakes of civilized nations of the past. We are digging them up every year. They cultivated the soma and neglected the psyche. Will our civilization persist in this same error and be numbered among the dead ones of the past?

Notwithstanding the coldness, contempt or conservatism of the profession towards suggestion, I am convinced it is along this psychic route that the evolutionary processes are slowly tending towards the fulfillment of that Biblical promise of knowledge that shall make us free. This knowledge can be no other than that man's Psyche is not only as old as his Soma; but that it was its creator and will eventually stand revealed as the dominating force or creative energy through whose influence man will rise above his present conception that matter is master, and so obtain freedom from all the limitations of matter that now control him. This "vicious circle" of materialism that is keeping civilization from its psychical heritage can only be broken by mental expansion, by thinking, and what class of men are more fitted to promulgate thought along these lines than doctors?

Who among you do not recognize deep in your hearts that human beings do consist of more than "a pailful of water and a handful of ash," that there is a spirit, soul or subconscious mind to be reckoned with that cannot be seen through the microscope or distilled by chemical analysis?

Why not admit a supreme spiritual or psychic director of the human body, omniscient, omnipotent and omnipresent? If you believe in a God who regulates everything, then I see no scientific or religious reason why you should not also believe this Psyche (which is as old as the Soma) should not be His agent or engineer, if not a part of Himself, and accept the Biblical aphorism that in Him "we live and move and have our being" as a *definite scientific fact* and not a poetic expression or a religious legend.

Speaking of legends, Mr. Rudyard Kipling at a medical meeting in London related one that is so interesting and apropos to my subject that I am going to ask your indulgence for a few moments longer. He said this legend has been transmitted to us from the remotest ages and has entered into many brains and colored not a few creeds. It is this: "Once upon a time, or rather at the very birth of time, when the Gods were so new that they had no names and Man was still damp from the clay of the pit whence he had been digged, Man claimed that he, too, was in some sort a deity. The Gods weighed his evidence and decided that Man's claim was good; that he was, in effect, a divinity and as such entitled to be freed from the trammels of mere brute instinct, to enjoy the consequences of his own acts. But the Gods sell everything at a price. Having conceded Man's claim, the legend goes that they came by stealth and stole away this godhead, with intent to hide it where Man should never find it again. But this was none so easy. If they hid it anywhere on earth the Gods foresaw that Man, the inveterate hunter, the father, you might say, of all hunters, would leave no stone unturned or wave unplumbed till he had discovered it. If they concealed it among themselves they feared that Man might in the end batter his way up even to the skies. And while they were all thus at a stand Brahm, the wisest of the Gods, said: 'I know. Give it to me.' And he closed his hand upon the tiny unstable light of Man's stolen godhead, and when that great hand opened again the light was gone. 'All is well,' said Brahm, 'I have hidden it where man will never dream of looking for it; I have hidden it inside Man himself.' 'Yes, but whereabouts inside Man have you hidden it?' all the other Gods asked. 'Ah,' said Brahm, 'that is my secret and always will be unless and until Man discovers it for himself.'" Will he ever discover it? Surely, but how soon will depend upon how much thought he is willing to expend upon it. The priests and philosophers of old soon gave up the search and concluded that it was outside the body of man—supernatural; but the medical man has persisted until he has explored every area and organ of the body and is now plumbing the "shadowy profundities of the mind." This is a promising trail; and if he will use the searchlight of scientific research in this field as diligently, fearlessly and without prejudice as he has in others, he will eventually find that ultimate secret of his being, hid within his own body by the crafty Brahm. As an evidence that we are getting hot on the trail, after searching the three kingdoms for remedies for disease, we are now discovering that the most potent ones are within our own bodies—the internal secretions.

There is no inherent positive force making for progress aside from the expansion of knowledge. No profession or body of men are more eager in the pursuit and expansion of knowledge than physicians, but

there seems to be at the bottom of each of us a timid conservatism which accepts progress reluctantly and which fears the consequences of new ideas before knowing just what they are or where they will lead. Truth is the goal wherever it leads.

Walter Bagot speaks of "the pain of a new idea," how it disturbs our old ideas, and whether they can rearrange themselves to accommodate the new comer or must vacate. We all experience it. To lessen this pain, I have tried to introduce this idea with a bit of local anesthesia in the way of its great antiquity and its general acceptance by medical science, both ancient and modern.

In this conception, the psychodynamism controls the individual. Our cherished chemical reactions, blood sugar, urea nitrogen, internal secretions, and all of these mysterious discoveries of the laboratory technician (which so few of us know anything about) are not disturbed; they are controlled by the directing idea, the psyche. Thus science will come to the aid of religion by proving, as a fact, what religion has taken on faith. Psychologists, physiologists, fundamentalists and modernists can all meet on this common ground; and even the late Mr. Bryan and the Tennessee legislature might have been placated. But this felicitous state all depends upon the plasticity of mind or the ability to change one's mind to meet expansion of knowledge, or, in other words, to give more than the customary ten per cent. thought on the most momentous subject that can engage the mind of man.

In conclusion, to help you arrive at this plasticity of mind (if you are not already in a state of profound coma) the advice and philosophy of J. Harvey Robinson in his "Mind in the Making" will prove stimulating. He says: "Most of our so-called reasoning consists in arguments for going on believing as we do; what we need is a reconstruction of mind." We must create an unprecedented mental attitude to cope with unprecedented conditions and to use unprecedented knowledge. It is not the defense of our cherished beliefs and prejudices just because they are our own, mere plausible excuses for remaining of the same mind. On the contrary, it is that particular species of thought which leads us to change our minds. It is that kind of thought that has raised man from ignorance and squalor to the degree of knowledge and comfort he now possesses. We are rising above a conception of life in which matter is master. The ascent is slow, but surely it can be hastened by our understanding of and conscious coöperation with the psychic laws of our dual nature.

DISCUSSION

Dr. L. G. Beall, Black Mountain: The discussion of such a subject as this would take much more time than the society at present has to give it. Even the reading of the paper required more time than our by-laws allow the author to use. The speaker has brought to mind one of the greatest factors in the well-being of the human race. We men who are in the mental side of medicine know that there is a great deal in auto-suggestion or in suggestive therapeutics. We can not follow the speaker as far as he goes, because that leads us far afield into the isms, Couéism, etc. Those isms have arisen, however, because there is something needful for the human race which the present generation of doctors is not giving them. Whether that be auto-suggestion, leading the mind out of

the realms of darkness, we do not know. There is one thought the speaker brings out; that is, he starts with autosuggestion and goes into the realm of human mind; and that thought is that the human mind is the divine spark which has been implanted in the human race, proving our relationship to the gods.

Dr. J. M. Northington, Charlotte: This paper, its presentation and its method of acceptance, illustrate a thing which was known to the wise Latin who said, "Facilis est descensus Averni," which is translated, "Easy is the downhill road to hell." It is natural that men should follow easily and approvingly those things which do not necessitate the operation of their minds, but all those things which necessitate the operation of their minds tire them and pain them. Dr. Mallett has devoted a great deal of study to this subject, and he has presented it in a manner which is well worthy the serious attention of this body. It is a matter which not only concerns us as healers but concerns us as makers of a living. The faith healers have arisen because of what? Because of the fact that the regular medical profession neglects this field. The osteopaths and the chiropractors and all the rest of the cults have arisen for that same reason, because medicine, regular medicine, has based its faith and its hope largely on a pill or a potion. This paper undoubtedly, as Dr. Mallett will agree with me, has many possibilities of error in it, but it contains a germ of truth that is well worth the consideration of all medical men.

THE TREATMENT OF CHRONIC URTICARIA AND CHRONIC ECZEMA

R. McBrayer, M.D., F.A.C.P., Shelby.

Three reasons provoked the presentation of this subject: (1) Our dearth of knowledge concerning the *modus operandi* of the accepted cause, a protein, (truly our knowledge seems only skin deep); (2) the great number of patients clamoring for relief, who seem forced to resort to Nansetti and other irregular so-called aids; (3) the great opportunities these diseases afford the general medical man for clinical research.

These two textbook entities are presented in the same discussion because in the present state of our knowledge their etiology, physio- and chemicopathology, and treatment are identical except in the handling of the skin lesions themselves. In this they differ little, and this is only symptomatic treatment. The various types of skin lesions are of no particular concern; therefore they are omitted from further consideration. One can unhesitatingly deny that these so-called entities are "skin diseases" and as stoutly affirm that they constitute a complex systemic state having the skin lesions merely as one of its many manifestations. To conceive of this condition as only a "skin disease" is comparable to defining typhoid fever as a disease of the intestines. Hence it is the medical man—the internist (not primarily the dermatologist)—who must grapple with the many perplexing and unsolved clinical problems confronted in this condition. Obviously rhus toxicodendron dermatitis, sunburn, the usual occupational eczema, and other dermatoses due to direct application of the irritant will be omitted and the time devoted solely to that chronic urticaria and eczema due to protein hypersensitiveness.

The etiologic factor can be accepted as the presence in the body proper of a protein (call it 'foreign' if you prefer) to which the particular person is hypersensitive.

The *modus operandi* of this protein in producing this state (and these diseases) properly comes under the ever-broadening term of pathology. In this domain our knowledge is fragmentary, nevertheless the facts and plausible theories must be held constantly in mind if we are to increase our knowledge and employ proper therapeusis. We do not know whether this protein acts as such or whether its incompletely split products or derivatives are to be blamed. There is some evidence to support each view, and possibly all three are etiologic.

What causes or allows the patient to become hypersensitive? Until this question is answered scientifically preventive medicine cannot be employed in this field. The guinea pig experiment to show anaphylaxis is classical, yet it does not answer the questions confronting us in these patients. Several factors undoubtedly enter into the production of the manifestations of this state and therefore these diseases: (1) Heredity —for so often do we see asthma, hay-fever, urticaria, eczema, migraine and angioneurotic edema in the same family even through three generations or more, while living under identical circumstances and conditions other members of society are spared. Emphasis can be placed upon four systems that may inherit weaknesses that at least predispose to this state: the nervous system, the digestive system, the skin, and the biologic system having to do with antibody production. (2) A congenital or acquired gut tube which slowly or improperly splits protein or one which, even independent of this error, allows incompletely digested (therefore "foreign") protein to be resorbed or at least to be resorbed too rapidly. (3) A liver that does not detoxicate properly the foreign protein arriving through the portal or general circulation. (4) Focal infection, at least in a few cases. (5) Very commonly a blood calcium deficit. (6) A skin that is more easily inflamed by croton oil and cantharides than the usual non-eczematous skin. (7) A nervous system that is not chemolabile, either to a slight or great degree. The symmetrical location of the skin lesions, the associated nervousness, the Widal hemoclastic crisis, the vasomotor disturbances especially as demonstrable in the histopathology of the skin lesions, the provoking of or the aggravating of the symptoms and lesions by emotional states, the occasional appearance of a toxic psychosis, the exaggerated reflexes and tremors, and the subnormal temperature, are convincing evidence that the nervous system (especially the autonomic) plays an important role in the production of chonic urticaria and eczema. As to the part played by the nervous system in the production of this state or these diseases opinion differs, some holding that the protein acts wholly on the nervous system and thereby results the vasomotor disturbance producing the general and cutaneous signs and symptoms, while others hold that the protein is the direct and local cause of the skin lesion through allergic or anaphylactic phenomena taking place in the cells of the dermis. There is some evidence to support each view; however, the truth is not known. Clinically we can probably handle this entity as well as if we knew the true secrets of the site of action.

Treatment. Eternally it must be remembered that the patient has a CHRONIC disease and that the patient as well as the disease must be

treated. The history and physical examination should unearth every possible physiologic and anatomic variation from normal. Especially should foci of infection be found, the probable offending protein or proteins suspected, the balance or imbalance of the diet determined, the personal hygiene (in its newer and fullest meaning) corrected and the integrity of the digestive and nervous systems determined.

Equally important is the determination by skin tests of the antigen or antigens. The scratch method is preferred to the intradermal test because (1) the latter is doubtless too delicate for clinical use and (2) there is a possibility of producing thereby very undesirable systemic effects. A clinically complete testing requires about 150 proteins. The grouping of 3, 4, or 5 into one test is very timesaving and certainly less annoying to the patient yet usually supplies the desired information. When several to many proteins produce reactions, the accurate keeping of a diet list on which the patient records symptoms and condition of skin lesions may be necessary for ten or more days to aid in properly placing the blame. Obviously withdrawing the specific protein from the body (as in apical infection, diseased tonsils, etc.), or dropping it from the diet results in a disappearance of the signs and symptoms, and the patient is clinically though not biologically cured. The hypersensitiveness may be univalent or multivalent, may be specific or non-specific in the present day meaning of these words. However, many instances of the non-specific class may prove, with advances in biochemistry, to be specific. Too, a patient may have both specific and non-specific hypersensitiveness in the clinical sense; the beginning, however, is doubtless specific. Discovery of the offending protein should be attempted at the first opportunity, because later others—even to many—may become offenders or antigens. One patient now progressing nicely after twelve stormy months was specifically hypersensitive to egg-white. The previous physician had suggested that she try a diet of milk and eggs for two weeks—obviously the worst possible suggestion or advice. At least six months were required to get her on a balanced egg-white-free diet. During that period I learned that coffee beans are frequently washed in an egg-white solution to give them a fresh, shiny, clean appearance; that some brands of baking powder contain egg-white; that steam from water in which eggs were boiling easily caused a violent reaction; that proximity to an actively functionating incubator seemed to aggravate the disease and that other unsuspected things contained egg-white. On one occasion I was at a loss to explain a flare-up when I discovered that the patient's breakfast bacon had been fried in a skillet used the previous day for frying eggs. Relentless study and work on the part of all concerned are required at times to get a diet and the environment chemically free from the offending protein, and the task is even more difficult when there are more than one specific proteins to be dealt with. In a few instances I have known physicians to belittle the value of skin tests and the concept of protein hypersensitiveness in these cases when the patient had never completely omitted the reacting protein or proteins. When some to many proteins give a reaction, one suspects strongly a non-specific sensitization and cautiously prevents holding forth a good prognosis by their withdrawal. Since invariably improvement of some degree can be noted, therefore restriction of these should be accomplished. In every case low protein diets are strongly in-

dicated. Great care must be exerted to keep the carbohydrates, vitamins, and inorganic salts above accepted needs, for there may be produced a dietary deficiency state—as I unfortunately permitted in two cases, one showing rather frank evidence of pellagra. Many times a patient will have just a limited tolerance to some reacting protein, in which cases improvement will continue with amounts of this protein definitely less than the particular limit of tolerance; while any exceeding of that limit shows itself very plainly. No one can intelligently and honestly treat these patients without first having determined the reacting proteins, and even then re-testing is sometimes indicated after a few months.

Adrenalin is a most reliable aid in controlling the skin lesions in acute exacerbations, though at times some hypnotic, even morphin, must be simultaneously administered to prevent or control marked tremors, chilly sensations, palpitation and other signs of powerful autonomic stimulation.

Calcium is clinically indicated in all cases. More scientific handling of this valuable drug will soon be possible when more laboratories can make blood calcium determinations. In exacerbations calcium chloride intravenously aids materially and in some cases wonderfully, though usually calcium iodid by mouth for months is sufficient. Very recently some Washington workers have proved the elevation of the blood calcium to and above normal by its oral administration, which is contrary to the teaching of pharmacologists a few years ago.

Specific and non-specific desensitization must always be seriously considered, though it must not be lauded too highly or employed by those not well informed on the details of the employment of each method. In employing non-specific desensitization recently my patient became very hypersensitive to milk and all dairy products, when these had previously been his main source of protein—so it has its disadvantages at times. Desensitizing for a specific protein may be done by mouth or hypodermically, though non-specific therapy is always done hypodermically. The usual proteins employed are casein, medicinal peptone, or shattered hemo-protein. Typhoid and other vaccines in relatively large doses aid invaluably in a few cases as both specific and non-specific desensitizers, and infrequently Mother Nature rescues the patient with desensitization by an acute febrile disease.

Supporters of Widal's hemoclastic crisis believe the administration of medicinal peptone by mouth thirty minutes before each meal is of value because the detoxicating function of the liver is thereby stimulated. No harm has been observed from its use, and doubtless it is of value; at least it should be resorted to in mean, advanced, or stubborn cases. After advising a physician to use peptone in this way he so little understood the accepted theories of its action that he decided to improve upon this method and therefore used stock "peptonoid" preparation because, he claimed later, it was "a food, a tonic and also peptone." The results were disastrous to the patient's chronic urticaria.

The time-honored use of arsenic has utterly failed in my hands. In fact, I actually know of no instance where it could be established that it was of material value; therefore I seldom, if ever, employ it in any form.

The x-ray has aided many cases symptomatically, though it has several handicapping disadvantages. The Finsen lamp has been used too

little in this country to permit its evaluation. The true mercury vapor quartz light is of the greatest value and is indicated, generally and locally, in every case for several weeks. There are five reasons for this: (1) The skin lesions, with their annoying symptoms, can almost invariably be greatly or completely relieved with one or two doses; (2) general metabolism, especially calcium, is materially aided; (3) a much less sensitive skin results; (4) no dermal and vascular atonicities result, as is so often the case where x-ray is frequently used; (5) seldom will ointments, lotions and powders be needed. In very few, if any, cases can one feel that modern therapy has been employed when the mercury vapor quartz light has not been used.

Putting much faith in local applications is comparable to treating moderately advanced tuberculosis with only a cough syrup. In only a very small percentage of the cases are these applications needed at all. One patient recently seen was made much worse by superimposing a chemical dermatitis on the allergic eczema by the use of a stock eczema lotion. Local medication varies with each skin and with each stage or type of skin manifestation, therefore to use such applications properly and to appreciable advantage one must be no less than an artist, rather than prescribing the same application at all times for all skins.

Purgation is to be condemned in this condition (which does not include the acute forms) for several bona-fide reasons—the most commanding one being the resulting chronic colitis which in turn adds a complication and undoubtedly permits greater resorption of toxic products or entities. A well functioning big gut is most desirable, and such should always be accomplished by proper diet, water intake, exercise, mineral oil, agar, and the like. Two or three evacuations at twelve to eight-hour intervals should be so acquired. Of course, simple suppositories and enemata aid. However, the value of high colonic irrigations with an argyrol solution, even at twelve-hour intervals if indicated, can not be overestimated in many stubborn and serious cases. Doubtless ox gall will aid in some cases, and Bacillus acidophilus properly administered will sometimes work wonders while helping very frequently. Fast periods—absolute fasting except for water—of 24 to 72 hours have materially aided improvement in many instances. Many patients can properly and to great advantage use a dietary compound which shows the percentage of protein, inorganic salts, vitamins, etc., in the various foods. This alone spares the physician many questions which logically the patient should ask.

Usually the associated gastric symptoms are due at least in part to a hypochlorhydria, which is obviously easily corrected.

Some of you would doubtless term this article most incomplete unless mention is made of glandular therapy. In many cases a basal metabolic rate determination is indicated. However, the interpretations must be guarded, because active skin lesions increase greatly heat loss, which in turn demands an increase in heat production and therefore in oxygen consumption. In a very few cases at puberty or the menopause one preparation of the corpus luteum given intravenously every few days has, I believe, been of value. Some theories concerning the thyroid and other ductless glands may eventually become facts and at least warrant scientific study.

A change of environment (and sometimes of physicians) many times begins the turn for improvement. This has aided materially in a case of each type within this year.

Obviously a plea for clinical research in this field is unnecessary.

PURPURA

Carlyle Morris, M.D., Maxton

Purpura is defined as a morbid state characterized by hemorrhage, subcutaneous, submucous, from free mucous membranes, and in some cases into the serous cavities. The word purpura (meaning purple) describes a subcutaneous hemorrhage; but, as will be shown, the term should not be limited to subcutaneous hemorrhage only but understood to describe hemorrhage in different locations and of varying degrees. Purpura is not a disease, strictly speaking, but a symptom, as many subdivisions of this condition have been described since the original disease; purpura hemorrhagica, was described in 1775 by Werlhof. Children from birth upward are especially prone to hemorrhage, and in adult life in both sexes purpura is fairly common.

As imperfect thrombus formation is constantly seen in this condition, with consequent hemorrhage, a brief review of the theory of clotting of the blood will be given. The theory of Howell is the most satisfactory and accounts for clot formation as a result of thromboplastin being liberated by tissue injury (blood-cells, platelets, endothelium) and acting upon antithrombin, which normally neutralizes the prothrombin. Thus the prothrombin is freed; and this latter substance, together with the calcium salts, forms thrombin and precipitates fibrinogen with the resultant clot.

Fibrinogen varies in amount in man and may be greatly depleted in liver injury in some conditions, among which are yellow fever and chloroform and phosphorus poisoning. Anti-thrombin is formed in the liver and may be in excess, as shown by Whipple, in cases of septicemia, miliary tuberculosis and endocarditis.

Various classifications of purpura have been made by different writers, W. Koch classifying all forms, including hemophilia, under the term "hemorrhagic diathesis", believing intermediate forms link the mildest and most severe forms. This classification would seem the most satisfactory, in view of our ignorance of the etiology of this condition. A clinical classification is as follows: (1) Symptomatic purpura, (2) arthritic purpura, (3) purpura hemorrhagica, and (4) chronic purpura.

Symptomatic purpura. This form of purpura is seen in the acute infections—typhoid fever, smallpox, measles, malignant endocarditis, septicemia, pyemia, whooping-cough, cerebrospinal meningitis and typhus fever, the purpuric spots being known as the exanthem in the last two infections; in the chronic diseases—tuberculosis, Bright's disease, Hodgkins' disease, syphilis, scurvy, pernicious anemia, and leukemia; and certain toxic substances cause this form of purpura, as snake venoms, benzol, and the drug, iodid of potassium.

Arthritic purpura. Painful joints is a characteristic symptom of this form, the mildest degree of which is known as purpura simplex and seen

most commonly in children with and without joint symptoms. So-called purpura rheumatica closely resembles acute rheumatic fever and is most common in males between the ages of twenty and thirty. Sore throat is present, usually a temperature from 101° to 103°, and joint pains. Purpuric spots are seen on the legs and about the affected joints. Recurrences may take place about the same time for several years in succession. Relapses and recurrences are significant as pointing to an infectious etiology for this form. Sore throat is frequently an initial symptom. Enlargement of the spleen is usually present. Albuminuria and acute nephritis may be complications and give further evidence significant of an infectious etiology for the symptoms seen in this form.

Purpura Hemorrhagica. This is a severe form of purpura with hemorrhage from the mucous membranes. It is the original form described by Werlhof as a disease entity and known as morbus maculosus. Epistaxis, hematuria, and hemoptysis may cause a marked anemia. Purpuric spots appear on the skin, increasing in number and size. Fever usually accompanies the disease. The average duration is two months, but chronic cases may last for years. It occurs in females in a ratio of four to one, and especially attacks young girls. There is a marked diminution in the blood-platelets. In the other forms of purpura there is no decrease in the number of platelets.

Chronic Purpura. This form may last as long as thirty years, the individual never being free from spots somewhere on the body. At times the mucous membranes are involved. Intermittent purpura, with attacks over long series of years, may also occur.

An acute form of purpura is known with painful joints, fever, epistaxis, gastric disturbances, conjunctival and subcutaneous hemorrhage, and hematuria. A recurrence of symptoms may take place. Visceral lesions, consisting of vomiting, diarrhea, pain, and melena, may occur in any type of purpura.

Etiology. Nothing is known definitely as to the primary cause of the different forms of purpura, but the almost constant factor of the presence of some infection (and in other cases, where an infection has not been proven, the probability of infection being present and undetected) would seem to indicate that some kind of toxin is the underlying causative factor in the vast majority of if not in all cases of purpura. Emphasis will be placed upon the probability of infection being the cause of purpura by listing all the different diseases in which infection is known to be present and in connection with which purpura occurs; and again those conditions in which the presence of an infection can not be excluded until its absence is proved. Purpura is associated with the following infections and would seem to be due to the toxin resulting from the infectious agent acting in some way upon the elements of the blood—probably, as has been advanced by one writer, by prevention of the formation of blood-platelets in normal numbers: Typhoid fever, septicemia, smallpox, measles, acute endocarditis, pyemia, typhus fever, cerebrospinal meningitis, tuberculosis, syphilis, scarlet fever, diphtheria, and plague. Those in which a toxin seems the etiologic factor are virus of snakes, benzol poisoning, and the purpura associated with necrosis of the liver and jaundice. Those in which an etiology of infection is most probable are cases resembling

acute articular rheumatism with the symptoms of sore throat, fever, and painful joints; cases described by Holt in his classification of purpura occurring in children as a hyperacute form beginning with a chill, vomiting, marked prostration, enlargement of the spleen, and as having all the characteristics of a general infectious disease; the rheumatic form; the severe form of purpura seen in children; and finally the severe form accompanied by fever seen in children and sometimes known as Henoch's purpura. Those diseases in which purpura is associated and in which an etiology of infection has been advanced are Hodgkins' disease, acute and transverse myelitis, pernicious anemia, leukemia, splenic anemia, epilepsy, and tabes dorsalis.

In purpura hemorrhagica, in which is usually seen some degree of fever and which is characterized by a low blood-platelet count, it is not known whether the low platelet count is the cause or the effect of the condition.

In two cases reported by Kaznelson, in one (of streptococcic pyemia with peritonitis, icterus, and purpura due to a decrease in the blood-platelets) microscopic examinations revealed an extensive destruction of blood-platelets in the reticulo-endothelial system, which shows an increased function and hyperplasia in all general infections; in the other cases (one of generalized tuberculosis of the lymphatic glands) marked destruction of blood-platelets was found, which may have been due, as stated by him, to the action of free ferments.

In a condition somewhat closely allied to purpura and coming in the large classification of hemorrhagic diseases, namely, hemorrhage in the new-born, the factor of infection has been present in a large number of cases. Of sixty-one cases observed by Epstein, no fewer than twenty-nine were associated with sepsis. Such a high incidence of infection is not always the case, however; but in view of the lack of any definite demonstrated etiologic factor in the other cases the probability of infection as the causative agent has to be considered. In another series of 190 cases studied by Ritter, hemorrhage from the umbilicus took place in 138, and from the umbilicus alone in ninety-seven, hemorrhage from the capillaries at the base of the umbilicus being the most frequent and excluding the factor of a continued circulation in the umbilical vessels and failure to properly ligate the umbilical vessels. The umbilical stump is an easy portal of entry of infection. In fatal cases of hemorrhage in the new-born ulcers are the only frequent definite pathological finding, but the cause of the ulcers is not known. An infectious cause is possible and is advanced as the etiology in cases of gastric ulcer by some writers.

Barabas was able to produce cutaneous hemorrhage in a number of children by pinching the skin, among the number being five of sixteen syphilitic children, and came to the conclusion that the tendency to cutaneous hemorrhage as manifested on slight trauma was due to an abnormal fragility of the vascular walls caused by bacterial or toxic injuries, which was followed by a degeneration of the endothelium of the blood-vessels. Greene, in writing of purpura, states that true purpura would seem to be a more or less direct expression of an infection.

Treatment. The immediate treatment of purpura is of great importance, as saving life, esepecially in small children. For evident

reasons it is highly important in other cases where the hemorrhage is not severe. The introduction of whole blood into the system by transfusion, to be repeated every eight hours or as often as necessary, is the most satisfactory treatment yet known. A single transfusion of fifty to one hundred cc. is usually sufficient. Agglutination tests should be performed in all cases when possible. When time is an important factor, the risk of any reaction caused by the introduction of blood not tested is small. Human bloodserum in doses of 10-30 cc. subcutaneously or 10 cc. intravenously, or whole blood in the same dose injected subcutaneously or intramuscularly, may also be used. Horse serum in doses of 10 to 30 cc. subcutaneously or intramuscularly may be used but is inferior to bloodserum. In cases accompanied by symptoms of acute articular rheumatism, horse serum in 10 to 20 cc. doses subcutaneously or intramuscularly is usually sufficient to control the purpura. Calcium lactate in 15 grain doses four times a day, the salicylates, and sodium bicarbonate may be used; but drugs do not seem to have any effect in this condition. General measures employed in the treatment of any infection, as rest, fresh air, nutritious food and tonics, should be a routine. In that form of purpura accompanying severe definite infections, as smallpox and measles, the treatment is that of infection itself.

A thorough examination to detect any possible focus of infection in all forms of purpura would seem to be important from the above, especially in those cases accompanied by the general symptoms of an infection, namely, fever, tenderness of the joints, sore throat, and enlargement of the spleen; and in sudden onset with recurrences after recovery. Infection would seem to play an all important part in the etiology of this condition, and permanent relief can be hoped for only by its detection and, where possible, its removal.

In this connection a single case history will be given which (while admittedly no definite conclusions can be drawn from a single case) may serve to emphasize infection as being an important factor in some cases of purpura. Name, E. R. Age 19, white, female. Chief Complaint: Purple spots on extremities, tenderness of the knee and ankle joints, and general malaise. Family History: Negative. Past Medical History: Patient has had purple spots on legs with feeling of lassitude but with recovery without medical treatment on two previous occasionos. Has had frequent attacks of sore throat. Common diseases of childhood. No history of any serious illness. History of Present Illness: Tired feeling for three days and nervousness which patient attributes to lack of sleep. Has lost appetite and noticed purple spots on legs for first time today. Knee joint and ankle pain on walking. Throat feels sore but does not hurt her to swallow. Physical Examination: Temp. 101. Pulse 105. B.P. 105-90. Examination shows fairly well nourished white female. The extremities show a few purple spots situated on the extensor surfaces of the thigh and leg just above and below the left knee joint. The left knee and ankle joint tender to pressure and manipulation but no swelling or redness present. Heart and lungs negative. No enlargement of spleen. Throat slightly reddened. Tonsils not enlarged. Teeth in apparently good condition. Blood count:

Hb. 70 per cent.; R.B.C. 4,200,000; W.B.C. 10,600. Malaria parasites negative. Urinalysis negative. Treatment: An initial dose of 10 cc. horse serum was given subcutaneously and repeated on the third day; 15 grains calcium lactate three time a day; sodium salicylate and sodium bicarbonate were also given. Temperature gradually subsided, and no new purpuric spots appeared. Joint pain disappeared. Complete recovery in two weeks. Patient was advised to have tonsils removed, and this was done two months later. Since removal of tonsils patient has felt much better, having gained ten pounds in weight, and has been free of any rheumatic symptoms or purpura up to the present time.

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DISCUSSION

Dr. Calvert Toy, Chapel Hill: The number of cases of purpura seen by all of us during a year is certainly not large. It is a rare skin lesion, not a skin disease. Dr. Morris has emphasized the role of infection in the cause of purpura. I believe that is well recognized in many cases of purpura, not the toxic ones, but many cases of simple, rheumatic, and hemorrhagic purpura. It seems certain that the reduction of platelets is the cause of the bleeding. When the platelets are restored to normal count, or restored to a certain level, bleeding stops. Recently Griffin and Hollaway, at the Mayo Clinic, have reported a series of twenty-eight cases of purpura on whom splenectomy was done, and six more cases were reported in the literature soon after. The result of splenectomy is striking in these cases: the platelet count rises and bleeding stops very shortly, and this is a lasting result. It is thought that the spleen in these cases has undergone "work hypertrophy" and is destroying excessive numbers of blood-platelets. Splenectomy, therefore, is effective by stopping this excessive destruction of platelets.

Dr. Cyrus Thompson, Jacksonville: I have in the last few years had a case of purpura hemorrhagica, a very grievous case that was right close to me. It was in a niece of mine, the daughter of my brother who died some three years ago. There is no enlargement of the spleen in this case; there never has been any enlargement of the spleen. I referred her to Dr. Wood, and if he were in the house I should be glad to have him talk to you. She had repeated attacks. About the etiology I do not know. If there was any infection that could have caused the dyscrasia, it was some slight infection about the teeth which did not show to any one but a dentist. The first attack came after the death of

her father. It was the culmination of an emotional breakdown and looked like a destructive termination of her grief. We tried the lime salts on her, and they did no good. She bled from her kidneys, bled from her throat, bled from her nose, bled from her gums, bled from her uterus, bled until she was the nighest-dead person you ever saw not to be dead. I took her down to Wilmington to Dr. Wood and Dr. Sidbury, and they transfused her, and for a while afterward she did well. After a few months, however, she had another breakdown. I tried horse serum on her (and when I did not have normal serum I used diphtheria antitoxin) with good effect on several occasions. These attacks came on about the time of her menstrual period; every one has been connected with a menstrual period. I suggest this to Dr. Morris and the younger men as a field for investigation. As to drugs, I gave salicylates, gave the lime salts, gave oils of cinnamon and erigeron, tried everything astringent or coagulant. I talked to Dr. Thayer of Johns Hopkins about her, and I told him I had found only one drug that was of any apparent value in her case, and its use was purely empirical. I have carried her along, and she is still living, sometimes fairly well. She was a little spotted the other day and I am fearful again. The remedy I used to best seeming advantage was five drops of spirits of turpentine three times a day. All of these attacks, as I have said, have come on about a menstrual period and after extreme grief or undue physical exertion. In the last attack she had bled copiously from the ear, which was the first time that this had occurred. She bleeds excessively and blanches white.

It is a rare disease (I have seen only two cases in forty-five years), and we may thank God that it is rare and for the temporary effectiveness of transfusion.

Dr. Morris (closing the discussion): The point that struck me in running over these cases was the etiology of an infectious nature. It is difficult to eliminate the etiology of infection in any case of purpura. While we may not find frank infectious tonsils or teeth, yet there may be some infection, and I think we should try to eliminate all foci of infection, so far as possible, in any case of purpura.

OBSERVATIONS ON PEPTIC ULCER*

W. O. Nisbet, M.D., F.A.C.P., Charlotte.

Table 1. This table shows the extent of our study and shows about the usual relative percentages of males and females. It is contrary to the old idea that more ulcers are found in young adult females.

Table 1—Peptic Ulcers.

	Males	Females	Total
Gastric	10	4	14
Duodenal	66	17	83
Jejunal	1	0	1
	77	21	98

*Read by Dr. D. H. Nisbet, Charlotte.

Table 2. This summary of ninety-nine cases shows the average age at which the diagnosis was made. In the case of gastric ulcer the average age was forty -seven years; in the cases of duodenal ulcer thirty-eight years. This makes it appear that ulcers occur rather late in life, but when we remember that the average duration of symptoms is from five to ten years we shall find that most of them occur in the thirty to forty decade.

Table 2—Average Ages.

	Gastric 47 yrs.		Duodenal 38 yrs.	
	Males	Females	Males	Females
20-30	0	0	19	6
30-40	3	1	28	7
40-50	3	2	18	3
50-60	2	1	3	0
60-75	1	0	2	0
	9	4	70	16

Table 3. Hunger pain coming on one to three hours after meals and subsiding before the next meal points to gastric ulcer. Hunger pain coming three to five hours after meals and continuing up to the next meal is suggestive of duodenal ulcer. As shown by this table, eighty-eight cases gave this symptom. We feel, therefore, that it is a very important diagnostic symptom.

Table 3—Hunger Pain.

Gastric	16 cases
Duodenal	72 cases

Table 4. In this series we had ten cases of gross hemorrhage, either hematemesis or by bowel. It is comforting to know that these hemorrhage cases rarely ever die during the hemorrhage, although their appearance is often alarming. There were no deaths in this series. Our treatment is as follows: (1) Absolute rest in bed; (2) Morphin and atropin by hypodermic to keep them quiet; (3) Ice bag to the abdomen, constantly; (4) No food or water by mouth for three to five days; (5) Intravenous injection of calcium chlorid to decrease the coagulation time of the blood; (6) Glucose saline drip is started within twenty-four hours, 500 cc. every six hours; (7) Should the bleeding continue, transfusion of blood from a properly matched donor is advisable; (8) Food by mouth is started in three to five days, always beginning with small amounts of milk and gradually increasing.

Table 4—Hemorrhage (No Deaths)

Gastric	6 cases
Duodenal	4 cases

Twenty-eight cases occult blood in gastric content or feces.

Table 5. No diagnosis of ulcer of the stomach or duodenum should be made without x-ray studies. A shown in this table, a diagnosis was made in only four cases without atropin check. The importance of atropin check-ups in suspected ulcer cases can not be overemphasized.

We find numerous cases which show a persistent irregularity in the pylorus or duodenal cap, and which look like ulcer, only to see these areas relax and smooth out after they have been given belladonna or atropin until the physiological effect of rapid pulse, dry mouth, and dilated pupils has been obtained.

Table 5—X-ray Defect after Atropin
88 out of 94 cases

Table 6. In these seventy-six cases where a stomach analysis was made there were no typical findings. We feel that this test is an aid in treatment; but we now know that ulcer cannot be diagnosed by it, as one-third of the cases show normal acidity, one-third a low acidity and the other third a hyperacidity.

Table 6—Free HCL

Gastric 9 cases 30 or above
Gastric 3 cases 10-20

Duodenal	0-20	25 cases
Duodenal	20-30	6 cases
Duodenal	30-40	19 cases
Duodenal	40-60	14 cases

Table 7. As you see from this table, the average duration of symptoms in the gastric cases was from eight and one half to ten years and in the duodenal cases from four and one half to six and one half years. This is too long for an ulcer to go untreated. The question arises as to whether we, as medical men, are examining our cases thoroughly enough, and whether we are considering the possibility of ulcer in all cases of indigestion. It is conceded by all that the acute ulcer should receive medical treatment. This is our chance. The best way to cure a chronic ulcer is to prevent it, to diagnose it in its early stages and to properly treat it. Early recognition and treatment would prevent the large numbers of ulcers which are passing into the surgical clinics. There is a definite ulcer problem in this country. We believe it would be well to have frequent articles in the State Board of Health's bulletins to educate or rather to re-educate us physicians and to inform laymen on this subject, on the danger of focal infection, and to teach them the necessity of eating properly prepared and rightly balanced diets.

Table 7—Average Duration of Symptoms.

Gastric	Duodenal
Male 8.6 years	6.4 years
Female 10 years	4.5 years

Table 8. We were able to get a follow up on all of the cases treated in the hosptals, or fifty-nine. The average duration of treatment was four weeks in the hospital, in bed, on a carefully regulated diet. They were followed where possible for twelve months and frequent x-ray studies made to determine the amount of improvement. Thirty-nine out of fifty-nine cases were clinically and radiologically cured. These cases were treated from two to five years ago, and that is perhaps too short a time of well-being from which to draw definite conclusions.

We feel, however, that 66 per cent. of cures, even in this small series of cases, offers us some hope of increasing medical cures as medical men make their diagnosis sooner.

Table 8—Treated Hospital Cases

	Cured
Gastric 9	6
Duodenal 50	33
Per cent cured	66.1

DISCUSSION

Dr. J. Shelton Horsley, Richmond, Va.: Peptic ulcer is a matter of particular interest and, like a good many border-line conditions, is one in which the internist and surgeon should coöperate. I think that every peptic ulcer should have medical treatment, and I think a good many should have surgical treatment; but there certainly always must be medical treatment whether there is surgical treatment or not. I was very much impressed by Dr. Nisbet's paper and especially by his percentage of cures. A thing which should be emphasized is the removal of foci of infection. I do not think that has been emphasized enough among medical men. In doing the pyloroplasty, which I have been doing for the last four or five years, I found I had a rather large number of recurrences. The mortality rate is not high, I having lost three cases in about seventy. In studying these cases, I found that in a few of the early cases there were adhesions along the gall-bladder. Now if adhesions along the gall-bladder are merely separated during a pyloroplasty, they will grow back and become worse than before. The gall-bladder should be removed, or else some other operation should be employed. If there is a latent infection in the gall-bladder, pyloroplasty merely stirs it up. There are certain types of adhesions that do give symptons. If you have an organ with a limited amount of motion, and that motion is still more limited by adhesions, you are likely to get symptoms. If there is a wide range of motion, the adhesions give very few symptoms. For instance, the large colon or the transverse colon may be densely adherent without symptoms, but if you get adhesions of the heart or of the chest wall the symptoms are very marked. So adhesions about the duodenum and gall-bladder will undoubtedly cause symptoms, whereas in a mobile part of the stomach they will not.

In looking up some physiology I found that Dragstedt had explained my trouble. In order to study peptic ulcers in dogs, he found the best thing they could do was to put a lot of sutures in the pyloric mucosa. You know the cardiac mucosa secretes the acid, and you rarely have peptic ulcer there, though you do sometimes. Since then I have abandoned the technic of suturing the pyloric mucosa and always handle it as gently as possible. Since that time I have had less trouble, though I do not now use pyloroplasty as much as I did at first. I find that it has a somewhat restricted though definite field.

I think it is better to do a mild operation first and a radical one later, if necessary. If a gastric ulcer is properly treated in the early stages it will frequently get well, but we should not delay too long in gastric ulcer. We can delay longer in duodenal ulcer than in gastric

ulcer, because in gastric ulcer we undoubtedly have as a consequence, sometimes, cancer of the stomach; and delay in the treatment of the gastric ulcer, while the cancer is progressing, is a catastrophe to the patient. Why it does not occur in the duodenum we do not know. Cancer undoubtedly comes from irritation. If there is irritation of the tongue and lips, cancer develops. But while there is no more irritated part of the body than the tips of the fingers, has anyone ever seen a cancer originating on the tips of the fingers? We do know, however, that irritation will frequently cause cancer; and I think if a gastric ulcer is not healed or markedly benefited in a few weeks or a few months the patient then undoubtedly should be operated upon, not only for the relief of the gastric ulcer but for the prevention of cancer.

Dr. D. H. Nisbet (closing the discussion): The fact that there is a malignant degeneration of gastric ulcer can not be denied. McCarthy, of the Mayo Clinic, has found malignant cells in the borders of chronic ulcers in about 19 or 20 per cent. of the cases. Ewing, of New York, takes issue with that statement and finds malignancy in 1 to 2 per cent. of chronic ulcer.

I want to emphasize again the importance of giving atropin after the irregularity has been found in the stomach, for I think it can not be emphasized too much. Very often we do have ulcer there, and I think in about 50 per cent we do find this irregularity, which will be cleared up by the atropin.

SOME ASPECTS OF CARDIOLOGY

R. F. Leinbach, M.D., Charlotte.

In selecting a title so unspecific as the one shown on the program for this paper, it must be apparent that I have allowed myself quite a broad territory within which to range. The remarks which I wish to make are indeed of a very general character and partake somewhat of the nature of an "airplane view" of the subject. We shall at least travel rapidly over the field. By cardiology, I of course do not refer to circumstances surrounding the practice of an exclusive specialty of heart disease. I use the word in its real sense as referring to the entire body of knowledge which we possess today with regard to the heart and its diseases. A part of this knowledge we may regard as scientifically exact and true, even if not complete; another part we may regard as empirically true; yet another part as more or less probably true; leaving us with a final residuum of knowledge of traditional character which is even now in process of being battered away, leaving us for the time being with certain props knocked out from under us but always leading to the establishment of firmer and more enduring foundations.

Within the past few years we have witnessed a striking intensification of interest in the problems of heart disease on the part of agencies occupied with the conservation of public health and on the part of clinical and research investigators in the field of medicine. Within the last two years The American Heart Association has been established, and only last October there appeared the first issue of the *American Heart Journal*, a most excellent publication put out under the editorial direction of The American Heart Association. The reasons for this intensification of in-

terest are not far to seek. It is a well known fact that throughout the United States there has been a marked increase in recent years in deaths from heart disease. Statistics at least appear to show this. Perhaps it cannot be said just yet how far this represents an actual increase in the morbidity rate, and how far it may be due to changed tendencies on the part of the profession in recording causes of death and to proportionate reduction in the deaths from other diseases of preventable nature. However this may be, heart disease now stands at the head of the list of causes of death. We may consider for a minute the situation in our own state, employing for this purpose the statistics for the year 1924, those for 1925 not yet being available. The total number of deaths in North Carolina for the year 1924 was 33,234. Deaths attributable to cardiac disease are classified in the annual report of the State department of health as follows:

Angina pectoris	225	
Acute endo- and myocarditis	154	
Pericarditis	70	
Other diseases of the heart	3212	
Total	3661	11%

To this we might add 468 "sudden deaths" from unknown causes, at least a large percentage of which were doubtless of cardiac or vascular nature.

We may pause to consider further another group of deaths:

Diseases of arteries	244
Thrombosis and embolism (Not included—81)	
Cerebral hemorrhage	2267
Chronic nephritis (over 10 yrs)	1607
	4118

If we should attribute to cardiac disease only one-half of the deaths in the above group and add them, with one-half of the sudden deaths, to the total deaths from diseases of the heart, we shall have a total of 5954 deaths from cardiovascular disease in general or a percentage of 18 per cent of the total deaths for the year. The magnitude of the problem can only be appreciated by pausing to consider that an equally large number of individuals will have passed from the scene from the same causes by the end of the current year; that another similar group are ripening for death during the year 1927; another similar group, probably already showing symptoms, are now undergoing pathological changes preparing its members for inclusion in the 1928 mortality tables of the State health department; and so on. Finally there is another group of apparently normal individuals who within the next twelve months will manifest for the first time their earliest symptoms of cardiovascular disease, to develop as time progresses into full blown cardiovascular cases for a later harvest. It is this last group which is perhaps most important to us as clinicians, while in our other role of conservators of the public health we must occupy ourselves so far as possible in the prevention of heart disease in

other groups the development of whose earliest symptoms is reserved for later years. The public expects and has a right to expect nothing less of us. The individual cardiac case, whether his supposed cardiac malady be real or imaginary, has a right to expect that all the resources of medical science, poor and inefficient as they may be in this year of 1926, will be brought to bear on his case. If we would help him it is necessary for us to be able to recognize, always bearing in mind our human limitations, the character of structural change, the degree of functional disturbance, and the etiology of his disease.

We must have a revised classification of heart disease, bearing in mind particularly the etiology of heart disease with structural change properly considered but in secondary relationship. Thus rheumatic heart disease is rheumatic heart disease, a distinct etiologic entity regardless of the extent of structural change, and should be so recognized, in order that we may fully appraise our status in this state as to this infection. Statistics for 1924 do not enable us to do this, for that period. A revised classification considering etiology, structure, and function has been proposed by Dr. Paul White recently; and it is probable that we shall see such changes brought about soon through the agency of the American Heart Association.

There is great need everywhere to-day for what I may call decisive pronouncements in the matter of cardiac diagnosis. Dr. Richard Cabot has recently said that "Most heart disease is imaginary". My own experience agrees strikingly with this statement. For every case of organic heart disease there are one or more cases of imaginary heart disease; cases requiring that the diagnosis of "apprehension neurosis, cardiac" be made in their cases. The importance of differentiating between the real and the imaginary cases of supposed heart disease cannot be overestimated. The cardiac neurasthenic is indeed a pitiable case. We often think of him lightly as a fool. The road to a cardiac apprehension is a broad one, however, and we shall not do unwisely if we give a sympathetic consideration to the natural features of the route by which he arrives there. Many people to-day are badly upset in their religious faith and are troubled about their future state. It is unusual to find even among the most orthodox one who contemplates his own demise with any degree of equanimity. Few would have the moral courage to say, as Count Mirabeau said to his attending physician in his terminal illness: "Well, doctor, am I dying bravely enough to suit you?" The laity know only too well the danger of sudden death in heart disease and, speaking generally, feel that heart disease is a thing for which very little can be done in a curative way. The cardiac neurasthenic comes to be subconsciously aware of the possibility that each day may be his last on earth. This fact undermines his ambition, and what is worse, impairs his ability to do any effective work in life by destroying his ability to concentrate his attention. Innumerable cases of this kind are to be found on the rolls of the Veterans' Bureau compensation list, some there perhaps because they wish to be supported; however, others are there because, receiving compensation for heart disease, they suppose with perfect reason that their days are numbered.

We of the medical profession are not guiltless with respect to this situation. In fact we are largely to blame. How? Because we are still working under the handicap of habits acquired two and three decades ago. Habits, I say. While the syphilitic, the tuberculous, the diabetic, and others receive a businesslike attention, the supposed cardiac case often receives (nay, generally receives) only a partial examination from which are left out important diagnostic procedures; and he is weakly told by the examiner (who himself is in a state of complete doubt as to the real condition and fearful lest he may have failed to find a real trouble) that the patient's heart is a little weak, that he has a murmur, that his heart is slightly enlarged, and that he must take care of himself. What is meant by taking care of himself is not explained by the doctor, and the patient does not know. The end result of such a consultation is that the patient leaves the doctor's office assured that he has a heart disease, that he can not be cured, and that unless he walks very circumspectly he may drop over dead at any minute. I do not think that I exaggerate the picture, and it is in just such situations that our very frequently seen cardiac apprehension neuroses find their genesis. How necessary, then, is it for us to differentiate boldly between real and imaginary heart disease! Real cases must not be carelessly dismissed. Those with simply a cardiac apprehension must be disposed of with vigorious, unhesitating, unqualified statements that no organic heart disease is present. I have known of the instance of a very able internist in another state assuring a patient that he had no organic heart disease and then prescribing a heart medicine which the patient knew was given him as a heart medicine before he left the office. The reassuranace which he gave the patient in his statement was entirely invalidated by his later act.

One should have the courage of his convictions, and how may we attain those convictions? Sufficient means are at our disposal, if properly used, in the teleo x-ray plate, orthodiagraphy, and electrocardiograph, postural blood pressure readings, exercise and amyl nitrite tests, Wassermann tests, other laboratory procedures, etc., to enable us to make decisive pronouncements in the vast majority of cases if we know what signs are present in what diseases. Here some degree of knowledge of cardiology is imperatively required. To be sure there remain to-day certain insuperable factors of error. It has been demonstrated that even in good clinics the existence of a chronic pericarditis is overlooked four times out of five. This, however, does not justify us in assuming an attitude of indecision and irresponsibility. We are dealing with important human problems and must assume the responsibility of advising patients courageously as to their mode of life "in the premises," as our friends the lawyers would say. I have dealt on this perhaps at some length because I am of the opinion that the cardiac neurasthenic is one of our important problems and that at least in some measure he is the unfortunate victim of unintentional medical suggestion.

I should like to refer rapidly in passing to some of the recent changes in medical thought with regard to the signs and nature of heart disease. Our one-time fashionable diagnosis of mitral regurgitation as distinguished from mitral stenosis has practically lost its standing. Dr. Cabot, in studying the necropsy material of the Massachusetts General Hospital records for a period of twenty-three years, has

found only seven cases of pure mitral regurgitation without stenosis in 1846 cases of heart disease of all forms. From this it becomes apparent that not oftener than once or twice at most in 500 cases of heart disease of all forms would a diagnosis of mitral regurgitation as differentiated from mitral stenosis be correct. We have learned as further development of this fact that the diagnosis of mitral disease where resting solely and unsupported on the presence of a systolic murmur at the apex, in the absence of chronic passive congestion, auricular fibrillation or other confirmatory sign, is a perilous one and often incorrect. The diagnosis, to be sure, may be made by the stethoscope alone but not without confirmatory auscultatory findings as the elicitation after exercise of a mid-diastolic murmur, etc. Mitral regurgitation, then, as a term in diagnosis might practically be abandoned, with little loss and greater gain.

Chronic fibrous myocarditis, another one of our favored diagnoses, has indeed been shown by Dr. Cabot to exist as an item of postmortem anatomy, occurring especially in elderly men with arteriosclerosis, nephritis and hypertension; but he has also demonstrated that most clinical diagnoses of fibrous myocarditis are wrong and that this type of pathology often is found postmortem even in gross form in cases in which no demonstrable chronic passive congestion was found after death. He argues, therefore, that the term "myocarditis" is not a proper diagnosis in those cases in which we have been most prone to use it; that is, cases of enlarged and weakened heart without evidence of valvular disease or pericarditis. The condition was found postmortem in about five per cent of their cases and was most commonly associated with coronary occlusion or narrowing, or perhaps the result of it.

A few brief years ago, we supposed that angina pectoris was in some way related to and indeed possibly caused by sclerosis of the coronary vessels. Dr. Cabot has again shown us in his latest remarkable book on the heart that of forty-four cases of angina, carefully autopsied, eleven showed no coronary disease whatever; and again that, in 127 cases of coronary narrowing as demonstrated at autopsy, only thirty-three or about one in four had angina during life. Angina pectoris, then, remains the mystery of cardiology, with its essential nature and cause entirely unknown.

The impression still prevails here and there that the cause of hypertension may be found in a given patient by careful searching, teeth, tonsils, etc., but most commonly is to be found in a nephritis. Much beclouding of the real issues has been brought about by this obvious misconception. The prevailing belief to-day is, I do not hesitate to say, that hypertensive cardiovascular disease is a disease in itself of which hypertension is the earliest recognizable symptom, and that its etiology is totally unknown. I made this statement in a paper before this section in 1920, and I am sure that it is more certainly true now than it was then.

The establishment of the clinical syndrone of coronary occlusion, thrombosis, and infarction has brought us a satisfactory explanation for many sudden deaths, for many acute attacks of violent precordial or epigastric pain with collapse, and also for lesser attacks of precordial pain accompanied with leukocytosis, slight fever and fall in systolic blood pressure, unrelieved by nitrites. Such attacks were up to recently con-

fused with angina pectoris, and their real nature remained unsuspected. Some even of the more severe type were operated on mistakenly for a suspected perforation of a peptic ulcer or other intra-abdominal condition. This syndrome is now sufficiently well established to be clinically recognizable in perhaps the majority of cases. Its importance is shown by the fact that a reasonable number of cases will recover if the patient is kept quiet and properly handled, depending on the point of occlusion and the size of the vessel occluded.

The electrocardiograph has unraveled for us the nature of practically all the cardiac arhythmias, tachycardias, and bradycardias. It has often been said that these disorders can all be recognized clinically without graphic apparatus. This I think may be true in simple cases, but in five years' use of the electrocardiograph I have been disillusioned a number of times. Many of the disorders are to be classed as functional, standing between the cases of organic heart disease and the imaginary ones. Their importance is to be found in that numerous cases of tachycardia of paroxysmal nature may be relieved by early appropriate medication, and the apprehensions of the cardiac neurotic, who is notoriously diligent in feeling his own pulse and noting its irregularities and its rapidity or slowness, may often be entirely dispelled when the nature of his irregularity is clearly set before him. I need say nothing in detail of the confirmatory evidences of mitral disease often found in the electrocardiogram, or of such conditions as bundle branch block, the diagnosis of which can be made no other way than by the electrocardiograph.

Notable progress has been made in therapy. Time permits only a brief reference. Most observers are agreed as to the value of quinidin in flutter and early fibrillation, especially in the early stages when yet of paroxysmal type. When fibrillation has lasted for years and the auricular muscle is thinned out and has become incapable of contracting as a unit, certainly no benefit is to be looked for. Quinidin has nevertheless attained, I believe, a permanent place in cardiology. The operation of cervical sympathectomy, with all its failures, may lead to a more efficient and less dangerous mode of relieving the terrible pains of angina pectoris. Indeed Swetlow, of New York, has already proposed and carried out with success paravertebral alcohol block of the dorsal root ganglia, a lineal but less dangerous descendant of the operation of sympathectomy. The use of a daily ration of barium chlorid to prevent the syncopal attacks of heart-block, introduced last year by Coln and Levine, promises much for victims of this malady. It is perhaps not widely known that the father of President Coolidge was entirely relieved of Stokes-Adams' attacks by the use of this drug later supplemented by adrenalin, and that his death ultimately was the result of malignancy of the prostate and not a cardiac death.

In concluding let me suggest that we give more attention to our cardiac cases in the coming twelve months, especially concentrating on those four thousand more individuals who this year will present themselves in our offices with their earliest symptoms referable to the heart, whether these symptoms be of organic disease, of functional disease, or imaginary. Let us give them the requisite amount of attention to enable us to make accurate diagnoses which will enable us to speak with decisive statements, avoiding so far as possible such terms as "weak heart," "a little

irregularity," "a little enlargement of the heart," with vague instructions to be careful. By so doing we may lessen the number of cardiac apprehension neuroses.

Finally, in filling out our death certificates this year let us not fail to use terms not only of structural change but also of etiology, in order that our Bureau of Vital Statistics may be able to group cases of heart disease by cause, as proposed by Dr. Paul White of Boston, into:

(1) Congenital, (2) rheumatic, (3) bacterial endocarditis, (4) diphtheritic (usually fatal), (5) syphilitic, (6) tubercular (rare), (7) thyroid heart disease, (8) toxic heart (metallic poisons, uremia, etc.), (9) hypertensive cardiovascular disease, (10) emphysema heart, (11) arteriosclerotic heart (cardiosclerosis), (12) angina pectoris, (13) coronary occlusion, (14) the heart of anemia, (15) traumatic heart conditions, (16) cardiac tumors.

DIGITALIS AND ITS USES IN CERTAIN CARDIAC ARHYTHMIAS

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Digitalis was used long ago in both civilized and uncivilized countries. Some of the series were used as arrow poisons by natives in Africa and the Eastern Archipelago. Digitalis was included in the pharmacopeia of Wurtemburg, but in 1721 was found only in that of London. After a few years it was dropped from this because of its so-called danger. In 1785 William Withering, of Birmingham, England, pointed out its marvelous effects in cardiac dropsy. He tells how he heard of an old woman in Shropshire who had brewed tea of many herbs which had a great reputation in cases of dropsy. When he obtained the recipe he decided that the active ingredient was foxglove. About this time he learned that a Dr. Carvley, then principal of Brasenose College, Oxford, had been cured of a hydrops pectoris by an empirical exhibition of the root of the foxglove. The following facts are drawn from Withering's accounts: (1) That digitalis was designed for use in dropsy; (2) that it was given until its pharmacological effect was reached; (3) that it caused slowing of the pulse; (4) that when its action was at its height the drug was withdrawn. In recognition of his great work, Withering's tomb at the old church of Edgbaston has a bunch of foxglove carved upon it. For many years after Withering's death the use of digitalis was neglected. Bidault and Villiers introduced it into France in 1804.

The plant digitalis purpura is indigenous to central and southern Europe. It is also found in Great Britain, Germany, and the United States. It belongs to the family of Scrophulariacia and is an herbaceous plant, biennial and perennial. It grows both wild and cultivated. According to Vaquez the digitalis of the Vosges Mountains, carefully gathered, has the most constant action. Preparations of the wild plants are considered more active than preparations of the cultivated ones. The powdered leaves constitute the most important pharmaceutical form of the plant. They are made by pulverizing the leaves of the second year's growth, deprived of the midribs, and dried in the fresh air and then at a temperature of 104 degrees F. (40 degrees C.). They have a beautiful greenish-gray color and an agreeable tea-like odor.

According to Cushny, the active principles of digitalis consist of two glucosids, digitoxin and digitalin. Vaquez mentions three, the first of which is digitalin (evidently the same as digitoxin). This is a crystalline glucosid isolated by Nativelli; it is insoluble in water, slightly soluble in cold alcohol, more so in hot alcohol, and especially soluble in chloroform. The second glucosid Vaquez mentions is digitalein, which is less active than digitalin. The third is digitonin, which belongs to the saponin group but is quite active in the fresh plant.

Belonging to the digitalis series are the other important plants: strophanthus hispidus, strophanthus kombe, scilla maritima or squill, and strophanthus gratus. The last contains a crystalline glucosid known as ouabain.

Locally, digitalis is primarily an irritant. Local irritation is often followed by paralysis of the sensory nerve endings. When taken by mouth, part of the drug is rendered inert in the stomach and intestines; the rest is absorbed slowly. When given hypodermically, part is decomposed; the rest is absorbed. It is excreted by both kidneys and bowel. According to Sollmann, absorption is more rapid by rectum than by mouth. When taken by mouth, the rate of absorption increases with the dose. The absorption of strophanthus, when taken orally, is very uncertain. The absorption of digitan is good. Sollmann says that excretion occurs chiefly through the bile. After absorption digitalis stimulates the central nervous system, especially the medulla, causing (in mammals) vomiting, rapid deep respiration and convulsions. Clinically, too large doses of digitalis may cause delirium. Digitalis excites the inhibitory cardiac (vagus) center in the medulla, causing slowing of the heart.

Applied to the frog's heart, digitalis affects the generation and conduction of impulses and the contractility. The power of conducting impulses is reduced: some impulses fail to pass from auricle to ventricle. Also there is a reduction in the rate of the auricle, due to fewer impulses being emitted by the pacemaker. There is an increase in the strength of contraction of auricle and ventricle. The ventricles finally go into systolic arrest; the auricles remain dilated. This action of digitalis on the frog's heart is a direct action on the muscle; it is not influenced by atropin.

The effect of digitalis on the mammalian heart has been divided by Cushny into three stages. In the first or therapeutic stage the heart is slowed, due to stimulation of the inhibitory apparatus. Digitalis does not slow the heart after section of the vagi. In this stage the ventricle contracts more completely, due to direct action on the heart muscle. The efficiency of the heart is increased in this state; the heart is slowed somewhat, but each beat expels more blood.

Cushny's second stage represents the beginning effects of overdosage. An excessive inhibitory activity takes place; the rhythm of the ventricle is slow irregular. The rate is so slow that the heart is not as efficient as it was before the drug was given. There is an inhibition of the conducting ventricle. Conduction is slowed, and some impulses do not get through; this condition constitutes partial heart-block. If no impulses get through, the ventricle beats independently at a rate of about forty beats per minute; this constitutes complete heart-block. If atropin is given prior to or during the administration of the digitalis, this second

stage is absent. As atropin paralyzes the inhibitory vagus terminations in the heart, the fact that it abolishes the production of block at this stage shows that the block is produced by vagus stimulation.

Cushny's stage represents the stage of profound digitalis poisoning. The ventricle is much accelerated, not due to paralysis of the vagus but to a marked increase of the irritability of the heart muscle produced by the direct action of digitalis upon the muscle. The auricles are also accelerated. Extrasystoles, of either auricular or ventricular origin, appear. They may form groups of two or three beats—pulsus bigeminus or trigeminus. The rhythm of the heart becomes more and more rapid and irregular. Finally fibrillation of both auricle and ventricle sets in, followed shortly by death. In the intact mammals, at the end of the third stage, the blood-pressure fails; the heart therefore stops in diastole. In the excised heart of the frog, as has been stated, the arrest is systolic. Systolic arrest is the "true digitalis effect" utilized in the frog method of biologically assaying digitalis preparations (vide infra). In the third stage, conduction from auricle to ventricle is reduced or destroyed; in this stage this effect on conductivity is due to the direct action of digtalis on the heart muscle; therefore it is not abolished by atropin.

In man, therapeutic doses of digitalis cause no change in blood-pressure. The increased output of the heart is compensated for the vasomotor center, which reduces the resistance in the peripheral vessels. In animals compensation is not as good as in man, and the blood-pressure rises when digitalis is given.

Digitalis possesses a distinct vasomotor action. According to Sollmann, dilute solutions cause dilation and strong solutions cause constriction. There is a variation in the degree of reaction of vessels in different areas. Constriction is strongest in the intestinal and splenic vessels, less in the renal, and weak in the vessels of the skin and brain. Therapeutic doses constrict the intestinal vessels and dilate the renal vessels and those of the skin, extremities and brain.

Digitalis is not at all or only slightly diuretic in normal individuals, but very markedly diuretic in cases of cardiac dropsy. This diuresis, of course, tends to remove the edema. This action is due to the improvement in the circulation brought about by digitalis in cases of cardiac decompensation. Digitalis has no effect on the anuria or edema of nephritis, because they are not due to defective circulation. Excessive doses of digitalis irritate the kidneys, according to some observers.

The gastro-intestinal response to large doses of digitalis consists in nausea, vomiting and diarrhea. The vomiting is caused by stimulation of the center in the medulla. That vomiting is due to central action rather than local action on the stomach is shown by the fact that vomiting occurs sooner after intravenous than after oral administration. If the alimentary tract is removed from an animal and a suitable amount of digitalis then given, vomiting movements will occur in spite of the absence of the alimentary tract. That there is some local irritant action exerted on the stomach by digitalis, however, is shown clinically by the fact that patients are slower to develop nausea and vomiting if digitalis is given hypodermically or by rectum than if it is given by mouth.

In the healthy man the rhythm of the heart may not be altered, even if the drug is pushed until vomiting occurs or some other symptom appears which shows that the drug has been pushed to the physiologic limit. In most cases, however, the pulse becomes slower, stronger and fuller. It must be remembered that strength of pulse is not a guage of changes in the heart muscle. In fever and after hemorrhage, the pulse is liable not to be slowed by digitalis. Calcium is said to increase the action of digitalis.

In electrocardiograms, inversion of the T-wave in lead II often occurs during digitalis treatment. The inhibitory action of digitalis on the function of conduction is revealed in jugular tracings by prolongation of the a-c. interval.

Vaquez, in the recent edition of his book on the heart, takes issue with Cushny concerning the nature of digitalis heart-block. He states that digitalis block is of muscular origin, and that the atropin test is no longer believed to be an infallible test of the origin of a disorder of conductivity. Silberman noted that, after digitalis slowing, atropin did not cause an acceleration equal to the rate prevailing before any drugs were given. This, he says, proves that the rate is not regulated exclusively by nerve action. It must be remembered that Cushny attributes the showing to vagus control only in the early stage of digitalis intoxication. Vaquez is of the opinion that digitalis block is not produced unless the auriculoventricular bundle is already in a damaged condition. He states that compete block is rare and is always transient. In healthy subjects, according to Vaquez, it requires large doses of digitalis to provoke extrasystoles; sometimes they cannot be elicited. In cardiac patients, however, extrasystoles appear with relatively small doses of the drug, due to the fact that the myocardium is in a state of abnormal excitability. He concludes, therefore, that digitalis bigeminy, like digitalis block, indicates a lesion of the cardiac muscle.

Libensky employed radioscopy and states that digitalis is practically without influence on dilatation of the left ventricle of the heart but that it acts much more efficiently on the right cavities. If heart failure is due to acute distention of the heart on account of loss of contractility, Vaquez concludes that digitalis will not be of benefit; it may even do harm by prolonging diastole.

Digitalis is by far the most useful drug available for the treatment of cardiac disease. A list of some of the conditions in which it is used follows: auricular fibrillation, paroxysmal tachycardia, complete heart-block, pulsus alternans, auricular flutter, cardiac decompensation, chronic myocarditis, hyperthyroidism, edema of the lungs, pneumonia.

In pneumonia digitalis is used as a heart support. There is a difference of opinion as to its value in this condition unless heart disease exists. Fever does not modify the digitalis action, according to Sollmann. In edema of the lungs occurring in acute nephritis, Held advises giving strophanthin intravenously, following it in about six hours with some digitalis preparation intramuscularly or intravenously.

In exophthalmic goiter and adenomatous goiter with hyperthyroidism, Willius and Boothby report marked beneficial effects from digitalis.

They used a standardized tincture. Slowing of the pulse occurred. They often digitalized their patients before operation. Many clinicians, on the other hand, consider that digitalis is contraindicated in hyperthyroidism.

In chronic myocarditis digitalis is said to do good, but it must be used cautiously if there is degeneration of the cardiac muscle. In cardiac decompensation the heart is rendered more efficient, as has been stated; edema tends to disappear, and dyspnea is often relieved. Aortic regurgitation is no longer considered a contraindication to digitalis administration, according to Sollmann. Neither is high blood-pressure a contraindication. Marvin *et al* recently reported preöperative digitalization of a series of general surgical cases. They state that no beneficial results were obtained.

Turning to the arhythmias in which digitalis is used, we find that Lewis states that the treatment of auricular flutter by digitalis is often most successful. If the attack of flutter has been present for some time, digitalis should be given in full doses. It is given until the flutter passes into fibrillation, then stopped; the heart returns to normal rhythm. This occurs because digitalis blocks the "circus movement" of the auricle.

In pulses alternans the indications for digitalis vary. The condition is due to exhaustion of the myocardium and should be improved by digitalis; digitalis must be used with caution, however, as an exhausted heart is more subject to poisonous effects.

Digitalis is sometimes used in complete heart-block. It is contraindicated in partial block, but if the block is complete it may be given, as it does not slow the spontaneous ventricular rhythm. Sollman says that digitalis tends to quicken the beat and render it more effective.

In paroxysmal tachycardia digitalis is not always effective. It may reduce the rate of the heart. Lewis says that attacks sometimes cease shortly after the intravenous injection of digitalis or strophanthin.

It is in auricular fibrillation that we find the great value of digitalis. Cushny calls digitalis specific for auricular fibrillation. The pulse is slowed, and the beats become stronger and more equal in size and in time. The auricles continue to fibrillate, but conduction through the bundle of His to the ventricles is lessened or stopped. This block is due to direct muscle action, not inhibitory vagus action; it therefore is not prevented by atropin. This special action in auricular fibrillation is explained by Cushny as being due to the extreme malnutrition of the heart which is often present in this condition.

In auricular fibrillation, it is in the younger persons of the rheumatic group that digitalis acts most successfully. A patient with a pulse exceeding 90 or 100 while at rest needs digitalis. To obtain the best results one should start with full doses. After the desired slowing has been brought about the dose is reduced, or stopped for a few days. Small doses are then continued for a long time. The heart rate should be kept between seventy and eighty. In some patients the pulse rate does not accelerate after digitalis is withdrawn until some new strain provokes a new attack. Others need doses of varying size to hold the heart in check. It must be remembered that the radial pulse is not the guide in this condition; the position of the apex-beat is the place where the heart rate should be counted.

Cases of auricular fibrillation with heart failure and slow pulse rates have been described; they are said not to be benefited by digitalis. Sir James Mackenzie, however, says that it may be taken for granted that a patient with fibrillation has a pulse rate of ninety or more. In any event, cases in which the heart rate fails to respond to full doses of digitalis are very rare. In urgent cases, with high ventricular rate, strophanthin intravenously may be given at the commencement of treatment. Small or moderate doses of digitalis may be continued for years. Diluting the drug and giving it after meals helps to prevent the development of nausea.

Most cases of auricular fibrillation wait until symptoms of decompensation appear before consulting a physician; therefore practically all cases seen need digitalis. As the heart slows its efficiency is increased, and the symptoms of decompensation begin to clear up. Occasionally a fibrillating heart becomes regular under digitalis, but this is usually transient. Most hearts continue to fibrillate slowly. In other words, digitalis does not cure the disease; it merely controls it. It is sometimes difficult to tell whether a well-digitalized heart is regular or not. The only absolute method is that of electrocardiography.

After these symptoms of decompensation are relieved, the dose should be sought which will keep the heart at the rate which enables it to perform its work with the greatest efficiency. Sir James Mackenzie says that the patient's sensations are of the greatest help in doing this. The patient readily appreciates any change in his response to effort. When he gets to understand these sensations, he is quick to perceive what digitalis does for him. Then the administration of the drug, according to Mackenzie, can usually be left safely in the patient's hands.

A sign that digitalis has been pushed too far and should be stopped is the development of a coupled beat—pulses bigeminus. According to Sollmann, pulsus bigeminus is not produced by digitalis in any other condition than that of auricular fibrillation.

There are several conditions in which digitalis is contraindicated. A partial list follows: sinus arhythmia, extrasystoles, partial heart-block, degenerated cardiac muscle, aortic aneurysm, hemorrhage, especially cerebral hemorrhage, recent embolism, uremia, and angina pectoris. Vaquez says that digitalis should not be given in disorders of conductivity because of its depressing influence on that function. Sajous states that in the tachycardia of hyperthyroidism and of cardiac neurosis digitalis is useless and may do harm. According to Mohler, the heart failure seen in postoperative surgical infection is seldom benefited by digitalis. In reference to angina pectoris, however, Gold reports that his experiments on cats lend no support to the fear that, in the presence of coronary occlusion, digitalis may precipitate ventricular fibrillation more readily than in the normal heart. Some patients are said to have an idiosyncrasy for digitalis.

Acute digitalis poisoning from a single large dose sometimes occurs. The symptoms are nausea, vomiting, abdominal pain, diarrhea, general depression, headache, giddiness, and precordial discomfort. The patient may go on to a state of collapse. The pulse is at first intermittent, then regular at about 40; later it may become more and more rapid and irregular and the patient lapse into a state of coma which ends fatally.

The most common type of digitalis poisoning is the chronic form, due to prolonged use of therapeutic doses. The drug has a cumulative action, due to its slow excretion. As the drug is continued, its concentration in the body increases. Symptoms usually disappear within 48 hours after the drug is stopped. Strophanthin should not be given intravenously, even in an emergency, if the patient has taken any digitalis during the three preceding weeks. Vaquez states that intolerance to digitalis appears slowly in the first use of the drug, but that it is much more precocious in later treatments. He also states that intolerance is much more frequent with galenic preparations, because they are believed to be less dangerous and are left more readily in the hands of the patient. He goes on to say, however, that the dangers of digitalis have been exaggerated and that it may be prescribed to the limit of tolerance, for there is always time to stop it when headache and nausea appear. Sollman says that the full therapeutic effect of digitalis practically coincides with the minor toxic effects and that no harm is done if the dosage is reduced immediately.

The symptoms of chronic digitalis poisoning are headache, giddiness, nausea, vomiting, and a slow and irregular pulse. Any of the clinical types of irregularity may be produced. Sinus arhythmia is the commonest irregularity to be produced by too much digitalis, according to Sollman. Partial or complete heart-block, extrasystoles, pulsus alternans, tachycardia, and even auricular fibrillation may appear. Sajous says that a decrease in the amount of urine passed, or actual suppression, is frequent sign of digitalis intoxication. The sudden disappearance of marked edema, when digitalis has been used over a long period of time, may result in a more rapid absorption of the drug with consequent poisoning.

That digitalis may cause disturbances of vision has been known since Withering's study of the drug. Purkinje described flickering before the eyes after administration of digitalis in 1825. Sprague *et al* recently described visual disturbances consisting of toxic amblyopia with dimness of vision, flickering and flashing scotomata, and marked disturbance of color vision. Jackson and Zerfas, and others, have described the occurrence of "yellow vision" in digitalis intoxication.

Another symptom of digitalis intoxication is delirium, especially nocturnal delirium. Plummer recently called attention to the toxic effects of digitalis on the central nervous system. Conner states that many cases of digitalis poisoning show it first by cerebral symptoms. He also reminds us of the fact that patients can be poisoned by digitalis although the pulse rate is not greatly reduced. He also says that hearts under the influence of diphtheritic, rheumatic, or alcoholic poison are especially sensitive to digitalis.

Turning to a consideration of the preparations of digitalis, we find that at first, in ignorance of the active principles, galenic preparations were used. These preparations, before the method of physiological assay, were very inconstant and unsatisfactory in their action; so when the glucosides were discovered they were preferred. Crystallized digitalin was used by Potain and Huchard almost exclusively. For several years there has been a tendency to return to the use of the galenic preparations. In the use of the glucosides we lost the allied and very useful action of

other substances contained in the leaves. According to the principles of pharmacodynamics it is preferable to use a plant rather than its active principle, because the plant contains a group of allied bodies the mixture of which acts better, and in smaller doses, than the active principle. In order to use these preparations satisfactorily it has been necessary to overcome two main objections to them, their instability and their inconstancy of action.

The chief cause of instability of these preparations is due to the production of oxydases which in time modify their action and develop noxious properties. These oxydases must therefore be destroyed. The French accomplish this by treating the plant with alcohol vapor at low pressure, in such a way as to cause desiccation of the plant with destruction of the oxydase.

The activity of a given preparation is determined by the biological test devised by Focke and Joanin and improved by Gottlieb. Unity is represented by the smallest quantity of the leaves that will cause systolic arrest of the heart of a thirty or forty gm. frog in thirty minutes. The frog method has been adopted as standard by the U. S. Pharmacopeia. The intravenous cat method has been used in many experiments. The fatal dose expressed in milligrams of drug per kilo of cat is called a "cat-unit". Berardi, Canan and McGuigan have recently described a dog method in which the production of nausea and vomiting and slowing of the heart rate are the indications of the drug action. The same dog can be used again after an interval of one week. By the use of these methods we are able to use preparations of constant activity.

The powdered leaves of digitalis constitute the most important pharmaceutical form of the plant. On exposure to the air they deteriorate rapidly, because of the presence of the oxydase mentioned above. Deterioration is more rapid in the tropics. Vanderhoof and Haskell have recently stated that it is not deterioration but loss of absorbability which occurs with age. Powdered digitalis enters into many official preparations, of which the best, according to Vaquez and Mackenzie, is the tincture. According to international agreement, one and one-half grains of powdered digitalis corresponds to one c.c. of the tincture. According to Goodall, the tincture of digitalis preserves its full strength for a year, after which it deteriorates.

The tincture, the infusion, and the powdered leaves would probably be classed as the three most important official preparations of digitalis. Niemeyer's or Guy's pill, which consists of digitalis, squill and mercury, is another fairly important official preparation. Cushny mentions the following preparations: the infusion, the tincture, digitaline, digalen, digipuratum (which is the same as digitan), digitoxin, and digifolin. Sollmann states that the standardized tincture is the best preparation. He also states that digitan is a very good preparation. If I, with what experience I have had with digitalis, were granted the privilege of voting with such men as Vaquez, Cushny, Mackenzie and Sollman, I would cast my vote for digitan. We used digitan almost exclusively in the medical wards of the University of Pennsylvania Hospital during 1921 and 1922, and I have been using it ever since leaving the hospital. I have seen more bigeminy, more partial and complete block, and more fibrillation

caused by its use than by any other preparation of digitalis that I know. The fact that it readily causes these evidences of overaction shows that it is an extremely efficient means of digitalization.

Digitalis may be given by mouth, intramuscularly, intravenously, or by rectum. Of course, the oral method is the most common and, when possible, the best. Digitalis by the intramuscular method is more or less irritating but is used in emergencies or when the stomach is irritated. The intravenous method may also be used, but according to Pardee it is a question whether digitalis by this method has any quicker action than large doses by mouth or by rectum.

Levy advocates the use of digitalis by rectum in cardiac cases with nausea and vomiting and after operations. He used a purified extract of digitalis leaves and obtained a therapeutic effect in all cases. The action was rapid in a good many patients. He found that most of the drug was absorbed from the sigmoid. One c.c. of the solution used contained 0.1 gm. of the powdered leaf. He gave eight to twenty cc. of this solution at a single dose. Zondek used rectal suppositories each of which contained 0.075 gm. of digitalis leaves. He states that digitalis by this method is absorbed as quickly as by mouth, and that in the presence of portal stasis it is absorbed more quickly.

Sollman describes three methods of oral administration: (1) the intensive method developed by Eggleston; (2) the cumulative method; (3) the maintenance method.

Eggleston, in the intensive method, measured the strength of his digitalis in cat-units. He used a tincture, one c.c. of which would kill one kilogram of cat. He gives fifteen cc. per one hundred pounds of body-weight of patient. Half of the amount is given at once, and the balance in divided doses every four to six hours during the rest of the day. He states that the effect continues from 4 to 15 days without further administration. Eggleston also says that his reason for giving only half the total amount in the first dose is due to the variation of absorbability of digitalis in different individuals. He recomends that all patients receiving intensive treatment be hospitalized.

The cumulative method consists in giving a daily dose of 3 to 6 c.c. in divided doses until the desired effect is obtained, and then reducing the dosage. The maintenance method consists in giving a daily dose of digitalis sufficient to keep up a continuous effect. Sollman says that the dose should not exceed 1 c.c. of the tincture per day.

Eggleston, in his article on digitalis in Nelson's Loose Leaf Medicine, also describes three methods of oral administration. (1) The small dose method; this consists in giving .12 to .25 gm. of powdered leaf or 1.25 to 2.5 c.c. of the tincture every four hours for four doses per day until digitalization is induced. This method may require a week or ten days. (2) The large dose method; this method consists in giving 0.4 gm. of the powdered leaf or 4 c.c. of the tincture every six hours for four doses, and then 0.2 gm. or 2 cc. of the tincture every four hours for four doses during the day. None is given at night. This dosage and interval is continued until digitalization is obtained. This is usually obtained in from one to two days. His third method, which he calls the body-weight method, is the method already described which Sollmann calls the intensive method. He states that if digitalization is not ob-

tained in the first twenty-four hours, one-tenth the total dosage may be given every six hours until it is obtained. If the patient has been getting digitalis during the previous ten days he should be carefully observed and should receive only 75 per cent. of the total calculated requirement in the first three doses. He also says that if nausea or vomiting appears or if the pulse falls below sixty the drug should be stopped.

Mackenzie usually gave his severe cases one dram of the tincture per day. This was given in doses of fifteen to twenty minims and was steadily pushed until a reaction was obtained; then the patient was put on a maintenance dosage. In very severe cases Mackenzie often used as much as two drams of the tincture per day. Here he obtained the reaction in two or three days.

The use of intravenous strophanthin should be mentioned, as it is a drug allied to digitalis and is important in the treatment of acute cardiac failure. Its effect begins in three to four minutes. It may be used to start digitalis therapy, followed twenty-four hours later by the oral administration of digitalis. As I have said, it is very dangerous to use the drug in cases which have been getting digitalis within the preceding few days; death has been known to result from neglect of this precaution.

Conclusions: Any attempt to draw conclusions from a study of this kind is more or less fruitless, but I believe that we can safely state: (1) that Withering's discovery was a tremendous boon to medical treatment; (2) that the galenic preparations are of more practical use than the active principles; (3) that digitalis is a comparatively safe drug in the hands of the observant doctor; (4) that digitalis is tremendously efficient in auricular fibrillation; and (5) that digitalis might be called the crutch for lame hearts.

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DISCUSSION OF PAPERS OF DRS. LEINBACH AND STANFORD

Dr. J. M. Northington, Charlotte: Dr. Leinbach spoke of these apprehensions of cardiac patients as being particularly present in neuropaths. I think a sharp line of differentiation should be drawn between those who are neuropaths and those who have a definite cardiac disease which will nearly always end with sudden death. I have a great deal of respect for the apprehension of death which is constant, which is not dependent upon observation by a doctor or some member of the family. I hesitate very considerably to disregard that kind of apprehension of death, and I do not think he meant to disregard it.

Permanent hypertension should not be confused with temporary hypertension. I saw in Hendersonville a patient with a systolic pressure of 270 and diastolic pressure of 160, with toxemia of pregnancy; and two days after the uterus was emptied the blood pressure came down.

Dr. Leinbach mentioned Dr. Cabot's book, "Facts on the Heart." Of course, Dr. Cabot is an authority on the heart, but he does a great deal of harm by his flippancy about treatment. He says somewhere in the course of the book, "The little I know about treatment will be found scattered through the book." If there is no treatment for these diseases, then medicine has nothing to offer the patient afflicted with them. Dr. Cabot is quoted a great deal by the irregulars; and I believe he is responsible for a great many persons going to the irregulars, because they say: "Here is Dr. Cabot, who is at the head of the medical profession, and he says nothing can be done." There is a great deal that can be done for these cases, even if a cure in the sense of a return to the normal is impossible. I know when a doctor is ill and uncomfortable he considers one who relieves his symptoms as a very valuable man. I want to condemn Cabot's flippant, supercilious attitude, for it does a great deal of harm.

Dr. Leinbach (closing the discussion): Dr. Cabot, of course, makes very broad and sweeping statements. In mentioning his book, the things I have brought out refer strictly to pathology. In reviewing some 1900 cases of cardiac disease, the autopsies of which were not made by Dr. Cabot but by men who had spent their whole lives studying pathology, we can not help but give some consideration to the fact that organic changes are more usually found than mentioned by him. When Dr. Cabot finds, as he has found, only four showing definite organic change, and when he finds considerable organic change in people who had no heart disease, that is another fact to which we have to pay attention. I think Dr. Northington did not mean to reflect upon these pathological findings. Those are facts which we must bear in mind and must consider. I think it is a well recognized fact that true mitral regurgitation is a somewhat doubtful entity, and the same is true of chronic myocarditis. That is a diagnosis we often make when the patient has doubtful symptoms and we are not able to determine what kind of cardiac disease he has.

Dr. Stanford (closing the discussion): There is one point in the discussion which I think should be emphasized, and that is that sometimes the apprehension of the patient is a very important point.

PRACTICAL ORGANOTHERAPY

Owen Smith, M.D., High Point

I have chosen this subject because of the questions that are asked me daily by the men who are engaged in general practice and who are keenly interested in effective and efficient additions to their therapeutic armamentarium. Some of the questions asked are: "Isn't this glandular therapy just a manufacturers' scheme to sell something new, just a commercial proposition?" "Do you get any definite, constant results from the administration of glandular products?" "Why do you use pluriglandular preparations?" (or "shotgun doses" as some put it).

I shall not make any attempt to give any orderly account of the practice of organotherapy; nor shall I go into detail concerning any one of or all of the hormones, feeling as I do that this can be obtained from any of the textbooks and periodicals devoted to this subject. I shall also limit this discourse to answering the above three questions in a general way and endeavor to show you why I believe in the help which can be obtained from the judicious employment of preparations manufactured from organic tissue.

First, the argument that the growth of organotherapy is due to the commercial instincts of the manufacturing chemists is patently absurd. No system continues to grow unless it is producing results. Any novelty may succeed for a time and up to a point, but beyond this its growth is controlled by its results. I would hazard a bet that the expense of manufacturing organic substances is a bar to their adoption and a brake to the enthusiasm of any manufacturer unless there is proof of persistent demand for them. It is also obvious that the sale of the ordinary inorganic chemicals and their multitudinous compounds is large enough to keep most manufacturers out of mischief; and yet practically all of the large drug manufacturers have established a department or laboratory to cope with the demand, not from the public but from the medical profession. Many large firms are occupied solely with organotherapy. Their products are costly, yet they succeed; I suppose because the physicians in turn succeed when they prescribe what their common sense dictates.

In a word, all business (and the manufacture of medicine is a business) has its commercial aspect, and this—unless it becomes the sole aspect—is normal and legitimate. I see no reason why the manufacture of pituitary, thyroid or ovarian extract should be more commercial than the hawking around of cascara, aloes or any of the multitudinous coal-tar products.

Coming now to the question of the results obtained from glandular therapy, there is little doubt in my mind that not a few practitioners are discouraged from using organotherapeutic preparations by the diatribes, often senseless, which are periodically discharged from mental storehouses of physiologists. These gentlemen, be it noted, are concerned solely with the effects proved to have been produced by experiments with animals; and their correct attitude to the clinician, when he states his case with regard to one particular substance and its effect upon the human being, should be: "It may be so, but it has not so far been shown to be the case in the laboratory." Too often it is: "We have not proved it, and therefore it is not so." This, however, does not deter them from proving subsequent to its establishment clinically (and in this instance decidedly subsequently) that an extract of the ovarian tissue, for example, does cause an increase in pituitary secretion. Most gynecologists know that the functional activity of the ovary can be stimulated or inhibited in a large proportion of suitable cases by the exhibition of the hormone or the chalone extracted from this gland. There are on the market preparations of this kind which I have found by experience to be both reliable and effective.

At a recent congress of obstetricians and gynecologists the combined use of thyroid and ovarian substance was recommended in conditions due

to the underdevelopment of the uterus and ovaries, particularly emphasizing the whole ovarian substance. As is well known to every clinician, the administration of thyroid extract is followed by very definite changes in bodily metabolism; and I may add without going into detail here that the metabolic rate is shown to be total—i.e., affecting proteins, fats, and carbohydrates. I may also add here, too, that the administrators of public health are applying the results of endocrine research to the prophylactic eradication of goiter.

The endocrine glands have become an important factor to all the specialists as well as to general practitioners. For instance, note the almost startling results the surgeons are reporting in the use of the infundibular extract in combating shock, due to its action on and by contracting the peripheral vessels and arterioles. This pituitary extract also has a powerful effect on all unstriped muscle all over the body. It therefore has a powerful effect on the uterus, especially in the pregnant, puerpural and menstrual states, and is of immense utility in a variety of obstetric and gynecological conditions. My experience with infundibular extract as a gynecologic styptic has been very satisfactory. The ophthalmologist is often the first to detect abnormalities of the endocrines —early exophthalmos or other eye signs of thyroid disease. Retinal abnormalities are often noted by him before any other noticeable symptoms of diabetes, and then these patients are referred back to the general practitioner for suitable organotherapy. The orthopedist will be consulted for myalgic and arthritic aches and pains which may depend upon the excessive strain of endocrine adiposity. The results in rheumatic and arthritic patients who have thyroid extract added to the usual treatment are sometimes startling, because of the assistance given to the dissipation of the toxemia. The urologist is consulted by anxious parents because their son's genitalia retain an infantile appearance, and he will be besieged by anxious husbands who fear lest they "lose their manhood" or who yearn for rejuvenation. The "wonderful" results claimed to have been gotten by operation upon the interstitial gland have undoubtedly depended, for the benefit received, upon administration of orchitic substance. I may add that the testicular hormones stimulate the whole endocrine system, hence the rejuvenation.

The pediatrician sees many little patients who baffle his therapy, from the cretin to all shades of delayed development both mental and physical. Every general practitioner, too, sees these cases; and until of late years and the coming of our knowledge of the endocrines we could not do much for them except pity the child and comfort the parents as best we could. These children are mostly of two classes: (1) The predominantly defective or otherwise deficient in thyroid function; and (2) those with no signs of hypothyroidism but in whom the mental and physical development is most markedly lacking. The first are cured by thyroid extract, as you all are aware and have doubtless demonstrated to your own satisfaction, so I shall not go into any detail here. The second or pituitary type is tersely described as of "small, delicate stature, but fat and flabby, with small feet and hands. Such a child eats abnormal amounts of starchy foods and sweets; has a subnormal temperature, low blood-pressure and slow pulse." (3) Mentally they are often as sluggish as they are physically. Most children of this type make good progress on

anterior pituitary alone, and I may say with a bit of confidence that all of them do well on a combination of pituitary and a small amount of thyroid. I shall not go into the other varieties of deficient or delayed development, such as the thymus type of infantilism. But if the child and his ductless glands are studied and the diet and habits correct, with pituitary as a sheet anchor, combining if necessary with thyroid or the gonads, we feel reasonably sure of satisfactory results in the great majority of cases.

As a matter of course the gynecologist sees more such cases of endocrine dysfunction than any other specialist. But right here let me say a word concerning team work between the general practitioner and the gynecologist. I believe that the practitioner should practice more gynecology and the gynecologist more internal medicine. Let me divide female patients into two classes and see if what I have just said is not a truism and worthy of your careful thought. The first group are those who come in frankly complaining of pain or discomfort in the pelvis. The second class are those who consult us (and by the way this is by far the larger group) whose symptoms do not at first suggest anything wrong with the pelvis, unless it be that old and vague symptom of backache, or that the kidneys are out of order when it is really the bladder. Most of these patients complain of obstinate constipation, with lack of propulsive power to expel the stool; some (and their name is legion) "just feel so weak and bad," saying they tire so quickly upon the least exertion. Upon inquiry we learn that this disability dates from a confinement, previous to which they were active and normal in every way. Some of these women show marked signs of toxemia even though the questioner cannot find fault with the teeth, tonsils or sinuses. But don't forget the cervical glands, fallopian tubes or bladder as foci of infection. The cervical glands are deep; cervicitis does not give pain nor much discharge; and antiseptic douches do not reach the infection. My point is this—the general practitioner does not examine this class of patients beyond the usual questioning and then prescribes the usual tonics, et cetera. A thorough examination of these cases will so often reveal a relaxed pelvic floor, stasis of the bowel, enteroptosis perhaps, focal infection of the cervix or tubes, or perhaps a bladder with retained urine caused by a retroverted or prolapsed uterus. This condition is similar to the retention seen in men with enlarged prostate glands. These conditions do not often lead the patient to complain of the pelvis, and these foci of infection are overlooked by the cursory examination; yet these very focal infections are responsible for the endocrine syndrome of which your patient is really complaining. In treating these cases you will, of course, remove all foci of infection, if necessary carrying out a surgical procedure to do so; but you will find that the administration of the hormones will hasten very materially the clearing up of your patient's neurasthenia and the general symptom-complex of which she still complains.

Perhaps the most striking results that we see in everyday practice from glandular therapy are those in which we have some ovarian dysfunction. The ovary has two distinct internal secretions, and, as I said before, these control the menorrhagias and metrorrhagias, in functional cases, to a marked degree. The catamenia may be increased or diminished, as you wish, by giving either the hormone or the chalone. Func-

tional amenorrhea will respond in almost all cases, not complicated with anemia, to thyroid and ovarian extracts. The nausea and vomiting of pregnancy (non-toxic) will be relieved and controlled by corpora lutea, given either intravenously or subcutaneously. The distressing symptoms accompanying the menopause are greatly lessened, if not entirely relieved, by the administration of corpora lutea.

Now we come to the real bone of contention with our ultrascientific confreres, and that is: Why do we use pluriglandular formulas? Until our diagnostic ability has been further enhanced by new instruments of precision, we shall continue in a state of somewhat blissful ignorance regarding the absolute identiy of at least some of the hormones which cause the metabolic upsets we see. However, the knowledge of the glands and their functions is being daily unfolded to us, and while in some instances we have yet to ascertain just what the function of each secretion is, we *do* know that each has its function and does act a role of major importance in the play of life. As it is manifestly impossible in the majority of cases of endocrine disturbances to determine which glandular component is at fault or to what extent the whole system is involved, it seems but rational that we must give the patient the advantages of benefits accruing from all secretions of the various endocrine glands, rather than one or two. There are many good reasons for using more than one gland at the same time in the treatment of the same patient. And, by the same token, there is no excuse for using all the endocrines in every dose given, expecting the body cells to select from such hodgepodge the hormone which they need. It is well known (I believe even our endocrine nihilists admit it) that some glands have overlapping zones of influence. By this I mean, for example, that the anterior lobe of the pituitary, the thyroid and the adrenal cortex exert a stimulating influence on the osseus and genital systems. Would it be criminal to use these three glands at the same time if one were unable to decide which one is most at fault?

Examples of the interrelations of the endocrines are numerous. The pituitary undergoes considerable hypertrophy after thyroidectomy. After the removal of the pituitary in the tadpole, the thyroid and interrenal bodies fail to function; but function and structural restoration can be brought about by the use of pituitary substance, the anterior lobe having the most pronounced effect. In severe cases of diabetes coming to autopsy, where it is found that the pancreatic changes are slight, the adrenal cortex shows considerable degeneration. Likewise, if a considerable portion of the adrenal cortex is removed, glycosuria develops even if the pancreas is intact. The pancreas is unable to maintain a normal blood sugar in the presence of severe liver insufficiency, as shown by animals from which the liver has been removed; also the liver is unable to maintain a sugar-free urine in the absence or considerable reduction of the pancreatic hormone, insulin. It is quite likely that the liver loses its detoxicating ability when the parathyroid hormone is absent. More cases of non-toxic goiter develop at puberty than at any other age, and the use of ovarian substance in their treatment is urged by such authorities as Braun, of Philadelphia.

I think most men would admit that in a department of experimental medicine, or in a charitable institution where the patients should be used

and observed for teaching purposes, uniglandular therapy is the method perhaps of choice for obtaining additional information; but in everyday practice where our business is to relieve and to cure patients, the doctor should use every means at his command for that purpose. To prolong a patient's disability by using one gland at a time, when pluriglandular therapy might hasten his or her recovery, is certainly sacrificing the patient's interest to our quest for "scientific information."

Naturally pluriglandular therapy is not indicated where it is patent that one gland is the sole disturber. But unless all symptoms point directly and unmistakably towards one particular gland (and this is very seldom indeed the case) there simply is no way of telling absolutely just which refractory gland or glands are on the rampage. So without these to-be-desired methods of revealing the identity of the slacker glands we must employ pluriglandular therapy, unless we take a pot-shot or two. In that event we are just as apt to prescribe the wrong one. More often than not the guess is a poor one, and such a method savors strongly of passing the salt and pepper to a deaf, dumb and blind man who really wants sugar and cream for his coffee but cannot adequately express his desires.

Don't forget that the endocrine system is pluriglandular—gonads (male and female) suprarenals, thymus, spleen, thyroid, parathyroids, and pituitary. But what has been called the "endocrine constellation" has not been mapped out with any degree of scientific accuracy, and while disease affects the endocrine system, the functional upset of this system does not always mean disease. Some day, when the millennium comes, we shall be able to make absolutely correct diagnoses and prescribe the very remedial agents which will satisfactorily correct those faults. But the millennium is not yet upon us, and men are frail creatures, as they have ever been.

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DISCUSSION

Dr. Harry C. Brockmann, High Point: I feel that a general discussion of this subject is now in order. It is a new subject, in a new field; and on every general program in this society for the next few years I think we should have a discussion of it. There is one thing we should always bear in mind in the employment of endocrine products, and that is we must have pure endocrine drugs. I do not doubt that all of you have the same experience I have—every mail brings advertisements of endocrine products, pluriglandular and otherwise, without stating the exact formula. Our mails are flooded with advertisements of various proprietary drugs. When you consider the postage, printing, and everything else, the cost of these advertisements is found to be enormous; and, of course, the price of the drugs must be enough to cover that and the cost of manufacture and allow a profit to the dealers.

Just as physiotherapy has its proper use, I feel that glandular therapy has a proper use. The more attention we give it as physicians,

the less will be the opportunity of commercial people to exploit us and to exploit the public. It is our duty to adopt what is right in these things and let the public know that we use them, because if we do not use these things the faddists and cults are going to use them in the wrong way.

I think it is important, when we get a case that we think may require endocrine therapy, to make an unusually thorough physical examination and to employ along with endocrine treatment any other forms of treatment which may be indicated. My experience with this has been exceedingly limited. One phase upon which Dr. Smith did not place much emphasis is the use of insulin, probably because he feels that all of us recognize the importance of that. Other products I have used to definite advantage are pituitary extract, thyroid extract, and corpora lutea.

Dr. Smith's references to the physiologist and pharmacologist are well taken. It is our duty to coöperate with these gentlemen and to use these materials on a rational basis. As to learning whether an advertised product is of any value, or not, I think we should use more of the books put out by the American Medical Association, such as "New and Non-Official Remedies." When we are in doubt about anything we have a very reliable source to fall back on. As members of the American Medical Association we have our representatives working in that field, and we should use its Council on Pharmacy and Chemistry more than we do.

I am very glad to see this subject taken up, and I think we should come back next year and discuss it further.

THE ROLE OF IODIN IN THE TREATMENT OF GOITER

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The beginning of iodin therapy in goiter dates back to 1170, when Roger of Salerno used the ashes of seaweed in treatment of goiter. It was not realized that iodin was the causative factor until the time of Coindet, who, in 1820, found iodin in seaweed. In 1850 Chatin demonstrated that iodin would prevent the development of endemic goiter and cretinism. For a time following this, iodin was largely used. It remained for Kocher to first call attention to the dangers attending the indiscriminate use of iodin. He warned against giving iodin to patients who had hard, nodular, meaty types of endemic goiter (which we today call adenoma without hyperthyroidism), because symptoms similar to Basedow's disease were apt to develop. This condition he termed "Jod Basedow" but showed that the etiology was different from true Basedow's disease. In 1895 Baumann showed that iodin is a normal constituent of the thyroid gland, and as early as 1907 Marine was teaching that the normal function of the thyroid is dependent on iodin.

In the prevention of goiter, iodin has long enjoyed a well deserved popularity. That iodin does not cause a normal thyroid to hyperfunction is shown by the fact that iodin has been used for years in the treatment of other conditions, with no effect on the thyroid.

Marine and Kimball have shown that iodin does not harm in reasonable amounts, and that it will prevent endemic goiter from occurring when given to children of school age. In their classic experiments on the

school children of Akron, Ohio, iodin was given to nine hundred children, and a second nine hundred not given iodin were used as controls. In the nine hundred receiving iodin over a period of four years only two developed enlargement of the thyroid, while in the nine hundred not receiving iodin 347 developed enlargement of the thyroid. These results have been duplicated on several occasions in districts where goiter is endemic. The amount given by Marine and Kimball in their series was two grams of sodium iodid over a period of two weeks twice a year. Since this work was done some towns in goitrous regions have adopted the policy of giving chocolate-covered tablets containing ten milligrams of iodin once a week during the school year to children between the ages of ten and sixteen. Other towns have added iodin to the water supply, and still others have recommended the use of iodized salt. The logical way to give iodin in the prevention of goiter seems to be to give it only to children of school age and not to the entire population, as in the method of adding iodin to the water supply or of using the iodized salt. The reason for this is readily seen when it is remembered that in a region where goiter is endemic there are already many adults who have colloid goiters, many of whom have developed adenomata within the colloid; and these latter are very apt to be made hyperthyroid by the use of iodin.

Marine's investigations further tend to show that the adolescent goiter in this country is almost invariably simple colloid; that is, the first reaction of the thyroid to lack of iodin is a deposit of colloid in the acini of the gland. In many parts of Europe it has been shown that the usual type of adolescent goiter is the adenomatous type, so that where iodin may be used with safety in this country in the early adolescent goiter, it must be used with caution where there is a chance that the goiter may contain adenomata.

The general experience in this country has been that the danger of giving iodin to patients with colloid goiter under twenty years of age is practically nil, while above twenty the danger of inducing a state of hyperthyroidism increases with age. This is due to the fact that where colloid persists adenomatous masses are almost sure to form.

One of the chief difficulties in interpreting the effect of iodin in goiter has been the failure to distinguish between the different types of goiter. The clinical classification used here as a basis for a discussion of the effects of iodin on goiter is that of Plummer, who divides diseases of the thyroid into nine distinct diseases: (1) Diffuse colloid goiter; (2) adenomatous goiter without hyperthyroidism; (3) adenomatous goiter with hyperthyroidism; (4) exophthalmic goiter; (5) myxedema; (6) cretinism; (7) childhood myxedema; (8) thyroiditis; (9) malignant diseases of the thyroid. The first four of these are the only ones with which this discussion is concerned.

(1) *Diffuse Colloid Goiter:* This is a soft, symmetrical enlargement of the thyroid due to the deposit of colloid in the acini and unassociated with symptoms of hyperthyroidism. It is also known as the goiter of adolescence, simple goiter, and endemic goiter. This must not be confused with exophthalmic goiter, in which the gland is usually symmetrically enlarged; but in which there is a marked increase in the basal metabolic rate. In diffuse colloid goiter the basal metabolic rate may be below normal. In the treatment of this goiter iodin is very useful, and

if the patient is young a fairly prompt reduction in size may be expected. The form in which iodin is given is not of great importance, the important point being that it must not be given continuously for weeks or months without supervision. It is well to have some definite plan of administration, such as to give iodin for a period of two weeks out of every month. During this time the patient should be seen about every two weeks. If the enlargement has been present for any length of time the colloid is very apt to contain masses of adenomatous tissue, and iodin must be used cautiously. As a general rule it is safe to give iodin to these patients if they are under 20 years of age. After this it is best to use either thyroid extract or thyroxin. Surgery is rarely indicated in this type of goiter. In addition to iodin or thyroid extract it is advisable to clear up all foci of infection. In many cases the tonsils are infected, and in others carious teeth seem to have some bearing on the etiology. Cases that have not responded well to iodin therapy have been known to clear up very promptly following removal of diseased tonsils.

(2) *Adenomatous Goiter without Hyperthyroidism.* This is a nodular goiter which is clinically inactive, except possibly for pressure symptoms. It is also known as simple or nontoxic goiter. This type of goiter usually occurs where there has been a previously existing colloid goiter, the adenomatous tissue appearing at some time between the ages of twenty and thirty. In the typical case there is no question of the diagnosis, as on palpation definite nodules can be felt. In many cases the nodules are masked by an excess of colloid. This is the type of goiter in which iodin is contra-indicated, as it has been repeatedly shown that the administration of iodin to a non-toxic adenoma will in all probability convert it into a toxic goiter, and also that the discontinuance of iodin will not cause a cessation of the toxic symptoms. In a recent paper Hartsock, of Crile's clinic, has called attention to the increase in toxic adenomas due to the widespread use of iodized salt. It was not realized at first that the extremely small amounts of iodin in iodized salt would activate a quiescent adenoma, but he has shown conclusively that small amounts continued over a long period of time will in many instances cause toxic symptoms which are only relieved by a resection of the adenomatous mass. The only treatment for adenomas is surgical, and this should be done before the adenomatous masses begin to degenerate and produce symptoms of myocardial damage.

(3) *Adenomatous Goiter with Hyperthyroidism.* This is a constitutional disease caused by an activation of a previously existing simple adenoma. On examination of the thyroid gland it is seen to be similar to the non-toxic adenoma, but the constitutional symptoms are markedly different. There is an increase in the amount of thyroxin thrown into the system, which causes an elevation of the basal metabolic rate with the resulting secondary changes. Under other classifications this condition is known as toxic, thyrotoxic or hyperfunctioning goiter. It is the goiter that Kocher designated as Jod Basedow. Formerly this type was looked on as being an incomplete form of exophthalmic goiter. In 1912 Plummer showed this to be a separate entity, distinct from exophthalmic goiter. In his paper at that time he emphasized the fact that "if hyperplasia of the thyroid is of sufficient degree or extends over a sufficient period of time, exophthalmos is almost sure to develop. Also, no matter how in-

tense the intoxication from an adenomatous goiter not associated with hyperplasia, exophthalmos will not develop." In other words, his conception of the difference between the two types is that in adenomatous goiter with hyperthyroidism there is an excess of normal thyroxin in the body, while in exophthalmic goiter there not only is an excess of normal thyroxin in the body but an abnormal thyroid secretion present.

The onset of an adenomatous goiter with hyperthyroidism is very insidious, the enlargement being noticed on an average of 18 years before the constitutional symptoms become marked enough to cause the patient to seek relief. In a typical case the goiter is first noticed at the age of puberty, but as it gives no symptoms nothing is done about it. Later the patient notes an increase in the appetite, a gradual loss of weight and strength, and an increasing nervousness, together with the other symptoms that go with a hyperfunctioning thyroid. On account of the nodular type of the gland the typical case is readily diagnosed, but it must be remembered that in approximately one-third of all exophthalmic goiter there is an associated adenomatous condition.

In the treatment of this condition iodin, along with other medical measures, has no place. In fact, if the condition is only mildly hyperthyroid, iodin may so stimulate the gland as to make it markedly hyperthyroid. Thyroidectomy is the only rational treatment for this condition.

(4) *Exophthalmic Goiter.* To quote Boothby: "Exophthalmic goiter is a constitutional disease apparently due to an excessive, probably abnormal secretion of an enlarged gland showing pathologically a diffuse parenchymatous hypertrophy and hyperplasia. It is characterized by an increase in the metabolic rate with the resulting secondary manifestations, by a peculiar nervous syndrome and usually exophthalmos, and with a tendency to gastro-intestinal crises of diarrhea and vomiting."

The onset of an exophthalmic goiter is usually abrupt, and most cases are seen within six months to two years after the trouble commences. This is so true that where exophthalmos is found in a goiter of long standing there is almost sure to be present an adenoma plus hyperplasia. The progress is usually in cycles, while in the toxic adenomas there is a gradual increase in the symptoms. The patient with exophthalmic goiter may have a crisis, then after the crisis is over apparently be perfectly normal, in the early stages of the disease. Gastro-intestinal crises of diarrhea and vomiting are frequent in exophthalmic goiter and are lacking in adenomatous goiters. In the absence of a reliable basal metabolic rate, the neurasthenic with a small colloid goiter is frequently mistaken for an exophthalmic. This can be avoided at times only by careful attention to the history and physical examination. The quadriceps muscles are usually among the first to show signs of weakness, and this fact is frequently made use of in differentiating exophthalmics from neurasthenics. The exophthalmic patient, when asked to step upon a chair, is confident that she can do it easily and will either fail or almost fail; while the neurotic is sure that she will not be able to do it and yet does it quite easily.

The treatment of exophthalmic goiter is thyroidectomy, but in the preoperative preparation of these patients iodin is invaluable. Before Plummer showed that iodin would cause an abatement of the crises, it was customary to tide these patients over by means of rest, ice-bags, etc.,

until they should be over the crisis; and then in the bad cases to do a ligation or multiple ligations before attempting to remove the gland. Since the introduction of iodin in the form of Lugol's solution, it is not uncommon to see patients admitted during a crisis greatly improved in a few hours following large doses of iodin. These same patients, as a rule, will continue to improve on Lugol's for a period of ten days to three weeks. A few days after they have reached their maximum improvement thyroidectomy should be performed. Only very rarely is it necessary to do a ligation. The optimum dose of Lugol's for the average patient has been found to be ten minims three times a day well diluted in water. It is important to note that while Lugol's will cause a marked improvement in these patients the first time it is administered, they apparently establish a tolerance for it; so that subsequent administration of iodin will not cause as a rule as marked an improvement as was noted the first time. The present experience is that iodin will not cure an exophthalmic goiter and should only be used prior to operation. Every surgeon doing goiter work has had the experience of being called to see exophthalmic patients who have been given iodin on three or four occasions and who will no longer respond to it, and he is thus robbed of his best preöperative aid.

CONCLUSIONS

1. In the prevention of goiter iodin should be administered only to children. The use of iodized salt is impracticable and may be harmful.
2. Before prescribing iodin for a patient with goiter be sure that no adenomata are present.
3. Iodin will cause an abatement of the crises of exophthalmic goiter but will not cure the disease.

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DISCUSSION

Dr. William Banks Dewar, Raleigh: Dr. Sprunt's paper is very timely now because of the fact that in certain sections of our state goiter is on the increase. Not only that, but iodin has been thought by many people and a good many physicians to be a cure for goiter. This theory is, of course, false; and it has done much harm. The proper classification,

as an aid to differential diagnosis, is most valuable; because we can not treat these cases properly unless we know the type. The simple colloid goiter is said by Plummer, who is the foremost authority in this country on goiter, to be a compensatory enlargement of the thyroid. It usually disappears by the twenty-fifth year. Iodin will relieve this condition. If it has not disappeared by the twenty-fifth year, it is generally conceded that adenomata are present in it. Recently I have seen three cases of simple adenomatous goiter made toxic goiter, with increased metabolic rate, by the use of iodin. One of these had been given potassium iodid for three weeks, and the metabolic rate had gone up from normal to forty plus. There is never any exophthalmos present in simple adenomatous goiter; in Graves' disease, or exophthalmic goiter, exophthalmos will be present if the disease has lasted long enough. This is the type of goiter in which iodin may be used with great success as an adjunct to surgery. It is not a cure. These types are often mixed and are often difficult to differentiate. The most difficult differentiation is between the toxic adenomatous goiter and early exophthalmic goiter. The therapeutic test is very helpful here, as the exophthalmic case is greatly helped, with a lowering of the metabolic rate; and the toxic adenoma shows practically no improvement.

THE USE OF IODIN IN GOITER*

William Banks Dewar, M.D., Raleigh

In presenting this paper to the medical section of the State Society, I have been stimulated by an increase of goiter in many parts of our state, by a general misunderstanding of the various types of goiter, and by a general belief among the public and many physicians that iodin is a cure for goiter.

For many years iodin has been used as a therapeutic agent in goiter cases. The first authentic instance of its use occurred sixty years ago, when a beloved physician of Paris, by the name of Trousseau, accidentally discovered that it was of value in exophthalmic goiter. As the story goes, a young lady with a severe exophthalmic goiter consulted him. By mistake he wrote tincture of iodin for tincture of digitalis, and twenty drops were taken for some days. The patient returned in about two weeks, much improved, with a remarkable decrease in the rate of her heart. Finding his mistake, Trousseau then gave her tincture of digitalis. After a few days she became much worse. He then again prescribed iodin, and improvement promptly followed. Since that time iodin has been used in goiter cases.

It has been difficult to interpret the effects of iodin in these cases until a relatively short time ago because of the failure to realize that there are several different types of goiter and because of lack of well organized clinics, with proper follow-up systems.

According to Plummer, goiter should be classified as follows: (1) Colloid goiter; (2) adenomatous goiter without hyperthyroidism; (3) adenomatous goiter with hyperthyroidism; (4) exophthalmic goiter; (5) thyroiditis; (6) cretinism; (7) myxedema; (8) malignant disease of the thyroid gland.

*Read by title.

Only the first four of these are of interest so far as iodin is concerned. A differential diagnosis of each will be taken up briefly.

For years iodin and its derivatives have been given to patients with normal thyroids, and no ill effects have ever been noticed. In fact, some of our western physicians have gone so far as to make a thorough study of iodin in normal school children and advise its use in school children as a preventive of goiter. In individuals with normal thyroids this does no harm; but its administration to thyroid cases routinely is most inadvisable, as will be shown later.

The so-called colloid goiter, which is not at all uncommon about adolescence and the few years following, is our first consideration. The thyroid gland is generally symmetrically enlarged in this condition, due to a storage of an abnormal amount of colloid in the normal vesicles. No nodules can be palpated. It is much more frequent in females than in males. There are no toxic symptoms present such as tachycardia, palpitation, extreme nervousness, etc. The basal metabolic rate is usually slightly subnormal. Plummer, who is an authority on iodin in goiter, believes a colloid goiter to be probably a compensatory enlargement of the thyroid gland in its attempt to secrete more normal thyroid secretion; and in view of this opinion he advises small doses of thyroid extract. In cases of simple colloid goiter in which one can be sure that there are no adenomatous nodules present, iodin can be safely and effectively used. However, it is often without good results. Simple colloid goiter in the United States usually disappears by the twenty-fifth year.

Adenomatous goiter without hyperthyroidism usually occurs between the eighteenth and thirtieth year, although it may occur at any age. The gland is usually asymmetrically enlarged, and definite nodules may be palpated. There are no toxic symptoms present, and the basal metabolic rate is normal. Adenomatous goiter usually has its inception in colloid goiter. Some authorities believe that any enlarged thyroid after the twentieth year has adenomatous nodules in it. These nodules are formed by an abnormal increase in new acini. In this type of goiter iodin is positively contraindicated; for when simple adenomatous goiters are given iodin over a long period of time, they become adenomatous goiters with hyperthyroidism. It is very probable that people who have had simple adenomatous goiters without hyperthyroidism, which now have become adenomatous goiters with hyperthyroidism, have been made hyperthyroid by an increase of iodin intake in the water or diet. Recently I have seen three cases of simple adenomatous goiters without hyperthyroidism made adenomatous goiters by prolonged iodin administration.

Adenomatous goiter with hyperthyroidism has, in addition to the characteristics of simple adenomatous goiter, toxic symptoms such as tachycardia, tremors, palpitation, nervousness, etc., and an increased metabolic rate. It is rare before the twenty-fifth year and is simply a late stage of many simple adenomatous goiters. There is never an exophthalmos present in this disease. In adenomatous goiters with hyperthyroidism, iodin has little or no effect when given over a period of two to four weeks. It should certainly not be given over a long period of time because of the possibility of increasing the metabolic rate.

In exophthalmic goiter the use of iodin is a most sane and rational therapy. Plummer, again, was the first to establish definitely the value

of iodin in cases of exophthalmic goiter and as a measure for reducing the peculiar operative risks in this disease. For many years surgeons have realized that it is dangerous to operate on severe cases of exophthalmic goiter, because of increased toxicity and the crises after operation. It has been definitely proven that iodin, if given in sufficient amount, will bring these patients out of precarious conditions before operation and will prevent crises to a large extent after operation.

With the use of iodin in exophthalmic goiter the mortality has been reduced to a negligible percentage, in the hands of experienced surgeons. The theory of iodin in this disease, as explained at the Mayo Clinic, is as follows: The disease is not simply a hyperthyroidism; it is a hyperthyroidism plus a dysthyroidism. The exophthalmos is caused by an abnormal thyroid secretion and not simply an oversecretion of normal thyroid. Exophthalmic goiter is present some weeks before the exophthalmos is evident. This disease is practically always associated with a hyperthyroidism, but in rare cases there may be an exophthalmic goiter and a hypothyroidism. If the normal thyroid molecule is represented by a square, then the secretion in exophthalmic goiter is the square minus a small corner. When iodin is given it makes this abnormal thyroid molecule normal by adding this small insufficient corner and in doing this indirectly decreases the metabolic rate, toxicity, tachycardia, nervousness, etc. All of us have seen severe exophthalmic cases remarkably improved and the metabolic rate reduced after a few days of iodin administration. At this stage these cases can be operated on with practically no mortality. If the symptoms reappear after operation, the iodin should be increased; ten minims of Lugol's solution four times a day for ten days, with rest in bed, makes these patients much better operative risks. In severe cases large doses should be given. It is remarkable to see the cases of severe exophthalmic goiter before and after iodin administration. The severe cases with almost choreiform movements will be quiet and calm after a few days of Lugol medication. It has been shown that these cases may be made to return to ther original choreiform movements by simply leaving off the iodin. Iodin is not claimed as a cure in exophthalmic goiter. It may be given in grape juice. As a rule forty minims daily is sufficient except in severe cases. In cases with nausea and crises of cerebral or gastro-intestinal type it should be given by rectum in dosage sufficient to control the symptoms.

It must be said that these types of goiter are often mixed, and a definite classification is difficult. Exophthalmic goiter and adenomatous goiter with hyperthyroidism are often difficult to differentiate. A therapeutic test with iodin is helpful. The exophthalmic is distinctly improved under iodin, while there is no appreciable improvement in adenomatous goiter with hyperthyroidism.

SUMMARY

1. The indiscriminate use of iodin in goiter cases has done more harm than good.

2. Iodin may be used in school children who have no goiter with safety and perhaps do some good as a preventive.

3. In colloid goiter, without adenomata, it may be used with safety. However, small doses of thyroid extract with proper basal metabolic rate study is better.

4. In adenomatous goiter without hyperthyroidism it is positively contraindicated because of producing adenomatous goiter with hyperthyroidism.

5. In adenomatous goiter with hyperthyroidism it is of no value and should not be used over a long period of time because of producing an increased hyperthyroidism.

6. In exophthalmic goiter, iodin in sufficient amount will control the gastric and intestinal crises before and after operation and reduce the surgical mortality to a negligible percentage in the hands of competent surgeons.

A PLEA FOR BETTER BEDSIDE SANITATION*

W. D. Rodgers, Jr., M.D., Warrenton

I am proud to belong to that group of medical men in North Carolina who do not limit their thoughts or activities to any one class of the medical group but are alike interested in the prevention and cure of diseases in people of all ages and stations in life. The responsibilities of general practice have been lessened to a great degree during recent years by the conveniences of numerous hospitals with skilled specialists and expert nurses for the more serious and unusual cases, but still the burden of treatment of sickness among the masses of people rests upon the general practitioner. Similarly, through the agencies of our great State Board of Health, various welfare organizations, life extension bureaus, and the public press, great interest has been aroused in prevention of sickness; indeed, wonderful results have been achieved and some diseases eradicated. Still the burden of preventive medicine rests upon the general practitioner, and the best place for us to take our stand is at the bedside.

The purpose of this paper is to emphasize the importance to the general practitioner of keener interest in bedside sanitation in order to check the spread of infectious diseases at their source. Figuratively speaking, we as general practitioners might make a proposal to the sanitarians, public health officers, welfare workers, and similar bodies of men active in the prevention of sickness, that if they will control the carrier—the ambulatory source of infections, the sick person spreading diseases who does not consult a physician for advice or treatment—we will take care of the patient when we begin the treatment and see to it that there is no further spread from this source. Of course, such an obligation would be a big undertaking, but I feel that the medical profession of this state will accept the challenge. It will call for no experimental work but the practical application of known preventive measures.

It would take more time at the first visit to a patient to outline the preventive measures in a given case, for the physician's attention is so much centered on the problem of diagnosis, prognosis, and outlining the treatment that we sometimes fail to properly instruct our patients in the

*Read by title.

theories and details of preventive measures. We realize that preventive medicine requires education and understanding by the public and cooperation between the sick and the well. It is believed that the varied position of a physician in a community where he is to care for the sick and advise as to public health dangers, and his intimate contact with the sick, where he has the confidence of all, gives him an opportunity to give words of advice, warning and information which will have more beneficial effect than all other agencies.

The public is puzzled often to know why a doctor who comes in contact with all types of infectious diseases and has so much exposure is so seldom a victim of the disease. He is frequently accused of knowing what to take to keep well, when of course the secret lies in knowing the mode of spread of the special disease and avoiding getting the right germ in the right place. If doctors could keep their personal resistance good, they would practically never have any infectious disease.

A text book on the practice of medicine published in 1822 gives as the cause of most infectious diseases a "contagion" disseminated from the body by the patient and the secretions which are passed, which permeates the surrounding air and infects those who are exposed. Also, in malarial fever, the cause is given as marsh miasma originating from the decomposition of vegetable and organic matter in marshes and disseminated through the air. At this modern time, the terms "germs," "bacteria," "bugs," etc., are similarly used by the public with about the same meaning and understanding.

There is indeed a sad necessity for better understanding among people as to the theory and facts about germs, their biology, and their death, so that a better understanding about spread of diseases and disinfection can be procured.

In the minds of the average individual (not only the poor and ignorant) there is a haze of uncertainty about germs and disinfecting which is rather like the belief in ghosts among children or the superstitious. Some people think bacteria to be a species of bugs or animals, some a state of mind, or term used by doctors to describe something they know nothing about. Few realize that they belong to the vegetable kingdom; and that when germs are spoken of as causing diseases, as being transmitted from one person to another, or as being killed, a living plant is the subject referred to. They believe that there are such things as germs and have the fear of them in their hearts, but have no clear understanding as to just what they are.

Our patients must be taught that germs are plants, and like other plants there is a certain soil in which they grow. With germs it is within the human body, each germ having its place of election. They may live for some time outside the body but do not increase in numbers. Each sick person with any infectious disease must be made to realize that the germs have multiplied and are multiplying within the body, and that the individual acts as an incubator, so to speak; that the germs are cast off in a specific way and are capable of producing the same disease in another person.

We must emphasize at the bedside the modes of transmission of specific diseases and explain in detail the direct and indirect methods of

transmission. To tell a patient to hold a cloth or handkerchief in front of his mouth when coughing or sneezing is not so emphatic as to explain that the living plants may be carried eight feet through the air, infect the dust of the air in the room and go directly into the air passage of a well person and cause the same disease there. To tell a person not to spit on the floor is not sufficient nor as effective as to explain to the person that the sputum contains living plants or germs; that they might live outside the human body and may indirectly get into somebody else's air passage and cause the same disease within that person.

Having explained to a patient or parents of a patient that the disease is due to a certain type of plant, having in each case gone into a discussion of the habits and modes of transmission of the type of germ, it is simpler and better understood by all concerned how to check the spread of the disease, how to protect the loved ones at home, or the public at large, and how to keep from contracting a given disease when once exposed.

Of course, I do not propose to add anything new to the known preventive measures in sickness but I think it necessary to emphasize the importance of taking the time to be explicit in treating and handling a communicable disease. For example, in tuberculosis, think of how qnickly the disease might be eradicated if all the present cases which are bedridden and under a doctor's care would not transmit the disease to another person. There can be no doubt that much would be accomplished if every person were told that he has the disease, and then were to have explained in a simple and plain way just the nature of the infecting germ, how it is transmitted to another person, and what he can do and should do to keep from transmitting the same disease to others. Treatment is necessary, but I fear our patients are often in complete ignorance of just how and why to take necessary precautions. I cannot help thinking of the poor fellow who informed me that he was taking all precautions when he slept alone and did not use the same silver and glassware as the others but still had transmitted the disease to his only son because he frequently coughed and failed to muzzle it or destroy the germs. Similarly, in typhoid fever and other enteric infections, it is necessary for us to take the time to go into the details of the spread of the infections with the sick ones and the ones in whose home the disease is present, and all who are attending to the sick, in order that they may have a clear understanding of the whys and hows of the necessary precautions.

In the spread of infectious diseases of children, parents are often, in fact almost always, more ignorant than we have any idea as to how the disease spreads from one to another. They have no conception of what they are dealing with in their efforts to disinfect and do not know what germs are, and so right in the sick room the physician must give information and advice if anything is to be done to check the spread of the disease. Sanitation and personal hygiene are essential to emphasize and giving antitoxins and producing immunity are important, but we must intensify the warfare on germs. To do so we must acquaint our patients with the nature of germs, how they are transmitted from one person to another, how they are killed. There can be no better place

for this than in the quiet and impressive bedroom of a sick person, and no one can spread the propaganda of preventive medicine so well as can the general practitioner.

Our duties do not cease when we have made a call, consisting of an examination, making a diagnosis and writing a prescription, with a few remarks as to treatment, diet, etc., and telling the patient to take all "precautions." As individuals we must educate our patients and their families and then the public at large along the lines of scientific preventive medicine. More time must be devoted to giving the public a proper understanding of bacteria, their habits, modes of spread, etc. No one is so well qualified to do this as is the general practitioner, who is holding his own in the world of medicine and has the unbounded confidence of the public.

THE EARLY RECOGNITION OF GENERAL PARALYSIS; OBSERVATION OF MALARIA TREATMENT*

A. A. Barron, M.D., F.A.C.P., Charlotte

Because of recent advances in the treatment of paresis the question has become a popular and pertinent one. A discussion of this subject may not be amiss at this time.

General paresis is not infrequent. It has become more common of late years in this country. It is a rather common disease in Europe, rather rare in Africa and Asia. We in the Southern states, where most of us are engaged in private work, do not come into contact with this disease so often; however, the disease occurs more often than we suspect.

The crucial factor in the diagnosis of neurosphilis and, *a fortiori,* of general paralysis lies in the examination of the spinal fluid; the essential practical problem involved consists in the recognition of the indications for such examination. As Bunker has well stated there are three phenomena, the occurrence of any one or more of which should raise the question of the desirability of lumbar puncture; while its omission in the presence of any two of these phenomena places the responsibility upon the physician who rejects the need for examination of the spinal fluid under these circumstances.

The first of these phenomena is a positive blood Wassermann. All blood Wassermann patients are not neurosyphilitics; yet in many cases the persistence of a positive Wassermann in spite of protracted treatment is due to the presence of neurosyphilis. It is to be remembered that a not inconsiderable number of neurosyphilitics have a persistently negative blood Wassermann.

Second. With or without a positive Wassermann in the blood certain physical signs are, when present, distinctly suggestive: pupils which are unequal or irregular, the Argyll Robertson pupil, and absent or definite irregularity of knee-jerks or ankle-jerks.

Third. Certain symptoms, both physical and mental, of varied character and in themselves relatively indistinctive in their nature, occur with some prominence as the earliest manifestation of clinical neurosyphilis in many cases and are equally characteristic of the earliest onset of general paralysis. Bunker, in a recent report, found the following symptoms, enumerated in the order of their frequency of occurrence as

*Read by title.

the earliest signs: (1) irritability; (2) bradyphrenia; (3) loss of weight; (4) forgetfulness; (5) tendency to sleep; (6) speech defects; (7) insomnia; (8) judgment defects; (9) fatigability; (10) digestive disturbances; (11) impairment of vision; (12) headache; (13) rheumatoid pains.

In some ten cases during the past year observed by the writer, where a dependable history was possible, irritability and insomnia seemed to be the outstanding early symptoms.

Attempts to discover a successful treatment of general paralysis have taken two main lines; one which we might call specific therapy, whilst the other is non-specific therapy. I wish to speak of the non-specific therapy.

The non-specific treatment of general paralysis dates back to very early times. Hippocrates knew that febrile disturbances might exert a curative effect on the course of psychosis. Sydenham also observed this fact. The literature of the middle and latter portions of the nineteenth century contains numerous references to the improvement produced in psychosis by intercurrent febrile disturbances, such as typhoid, typhus, chorea, pneumonia, chronic suppuration, etc.

This observation led gradually to the adoption of various procedures devised with the object of producing suppuration or fever. These consisted essentially in the injection of various substances which can be grouped into three classes: (1) substances not derived from micro-organism—i. e., albumose, peptone and milk; (2) substances derived from micro-organism—i. e., tuberculosis, polyvalent, and typhoid vaccines, etc.; (3) the living micro-organisms of infectious disease. Wagner-Jauragg, of Vienna, found the best action from the latter, and in 1917 he began the treatment of general paralysis with tertian malaria. In 1925 I had the oppportunity of studying for a short period in this clinic.

The technic is rather simple and will be referred to only briefly. One or two cc. of infected blood can be injected either subcutaneously, intramuscularly or intravenously. After an incubation period, varying usually from eight to fifteen days, the patient develops fever and the malarial attacks commence. Experience has shown that it is desirable to allow the patient to have from eight to twelve febrile paroxysms.

In considering the suitability of a case to undergo the malaria treatment attention must naturally be paid to the somatic condition of the patient and to the age, stage, and form of disease. Marked cardiovascular renal disturbances contra-indicate treatment.

Gertsmann, acting chief of the Vienna Clinic, has reported results in so far as they concern patients treated between 1917 and 1922. He has treated something like 1400 cases. He confines his statistics, however, to 400 patients treated previous to 1923, in order that he might report only cases who had been observed two years or more after treatment. One-third, or about 33 per cent, remained in a state of clinical remission; about 15 per cent partial remission; about 52 per cent. slight changes, no change or dead.

In England the results, although less valuable than those from the Vienna Clinic, are nevertheless encouraging. In 209 cases treated 23

per cent. recovered sufficiently to be discharged from the asylum. This is of further interest in that before this treatment was instituted no case of general paralysis had ever been discharged.

The statistics in this country are less valuable because of duration of time. However, the reports coincide favorably with those of European countries.

At present it is impossible to forecast the result of any particular case. The earlier the patient comes under treatment, however, the more likely is the result to be entirely satisfactory. Gertsmann, after a review of 1000 cases treated at his clinic, says that good remissions are to be expected in the so-called early cases, in maniacal cases, in cases of simple dementia, in cases characterized by seizures and in tabetic cases; whilst poor results are obtained in golloping cases, in advanced cases, infantile juvenile cases, and in senile cases.

ARTERIAL HYPERTENSION*

VERNE S. CAVINESS, M.D., Raleigh

PHYSIOLOGY OF BLOOD-PRESSURE

There are several factors which enter into the production of any blood-pressure: (1) The heart beat; (2) resistence offered to the circulation in the blood-vessels, especially in the arterioles and capillaries; (3) the elasticity of the arteries; (4) the volume of the circulating blood.

Given a normal heart, the resistance offered to the peripheral circulation by the arterioles and capillaries is the greatest factor in the production of any blood-pressure, whether it be normal or abnormal.

Blood-pressure is easily influenced physiologically. Any change in posture will alter blood-pressure to some extent. Exercise, excitement, fear, anxiety, worry or any strong emotion will elevate the blood-pressure temporarily and may raise it to a very high figure. Persons who have the so-called essential hypertension may get a rapid and extreme elevation of blood-pressure from exertion and excitement. One of my patients had his blood-pressure raised by having car trouble while making a hurried trip to meet an appointment, so that when seen two hours later his blood-pressure was still elevated 60 points.

WHAT IS NORMAL BLOOD PRESSURE?

The systolic pressure probably varies widely normally. For several years I have considered any systolic blood pressure above 140 abnormal. Persons under forty years of age probably should never have a systolic blood pressure above 130; 120/20 is a normal pressure, and it is doubtful if it should ever be higher over a prolonged period of time.

Life insurance statistics vary somewhat. The New England Mutual Life Insurance Company specifies 145 as the maximum normal systolic pressure; the Metropolitan specifies 142 as the maximum; the North Western Mutual specifies 135.

There are a number of factors which influence blood-pressure, other than age. Weight plays a considerable part. The greater the weight the greater the capillary area which must be supplied with blood, and

*Read by title.

hence the greater the pressure that will be required. Climatic conditions play a part. Age and sex must also be considered. The general physical health, the type of arteries inherited, fatigue and the time of day, the position of the body, the time since eating, and even the general mental condition may affect a blood-pressure reading. It varies constantly in the same person under different conditions to meet the demands of nature for more energy or for the vital functions. Moschowitz states: "What is a normal blood-pressure either for the individual or the species has never been and never can be determined, because the pressure must vary according to the calls of the system for more or less free blood." In general the diastolic pressure should be approximately two-thirds of the systolic pressure, to give a pulse pressure of 50 per cent. of the diastolic pressure. However, this is subject to wide variations, as we shall see later.

Treatment of arterial hypertension has always been a failure. The reason for this is probably found in the lack of knowledge regarding the cause. A very prevalent and widely accepted theory of the cause is that it is due to constriction of the capillaries in the glomeruli of the kidneys. Another theory is that it is due to chronic nephritis which prevents proper elimination of the toxic products of metabolism. Both of these theories are probably erroneous.

Many efforts have been made to classify arterial hypertension. The complexity of the classification is due, at least in part, to a lack of knowledge regarding the subject. Possibly the most common classification is simple hypertension and essential hypertension. Another classification is functional hypertension and organic hypertension. There is probably not very much difference between these two classifications. Functional hypertension is practicallly the same as a simple hypertension and organic hypertension is more or less synonymous with essential hypertension. It is probable that the difference between simple and essential hypertension is one of degree, and that there is no distinct dividing line between them. Organic or essential hypertension probably begins as functional or simple hypertension and gradually becomes aggravated into a supposedly incurable form.

H. C. Anderson, in experimental work on rabbits, destroyed 65 per cent. of the secreting tissue of one kidney and after the rabbit recovered from this operation removed the other kidney entirely. This gave a loss of approximately 70 per cent. of the total kidney tissue and should represent a loss equivalent to a very severe chronic glomerulonephritis. The metabolites showed a definite increase in the blood. However, there was no rise in systolic blood-pressure.

Three extremities can be removed, representing an enormous loss of capillary area, and still no increase in systolic pressure be shown.

Normally we have a sufficient elasticity of control of systolic blood-pressure to permit large areas of arterioles to dilate or contract to control the flow of blood to different parts of the body. For example after a heavy meal, the blood is directed to the splanchnic areas and away from the skin, muscle, brain, etc. While running a race, the blood is diverted from the splanchnics to the muscles. This change can be so

sudden and widespread as to produce death in shock by dilation of all the arterioles and lowering the systolic blood-pressure. In sclerosis of peripheral vessels the elasticity of control of the circulation is lost, due to fibrous changes in the walls of vessels.

It is very doubtful if the glomeruli could play any part in the determination of blood-pressure when compared with such massive changes in vascular areas elsewhere in the body.

There are many theories regarding the cause of high blood-pressure which must be considered:

1. Persistent overeating appears in some cases to be a factor. However, it is probable that high blood-pressure results from intestinal disturbances rather than from actual overeating. Intestinal stasis is a great factor and is probably responsible for some cases of arterial hypertension.

2. Excessive use of tobacco is considered by some to be a cause. Personally, I doubt if it plays any part.

3. Alcohol probably plays no part whatever in the control of blood-pressure.

Arterial hypertension is often present in habitual users of tobacco and alcohol, but it is probably concurrent. Caffein in coffee, as well as alcohol and the nicotin in tobacco, raises blood-pressure temporarily, but such a rise is probably never permanent. Like the increased pressure from mental work and strain, there is a tendency for the pressure to return to normal with rest and relaxation.

4. Various intoxications appear to produce arterial hypertension. Those chiefly seen are in workers in lead, mercury, and zinc. In these persons we get a rather marked arteriosclerosis which probably begins in the peripheral circulation. This is doubtless a similar condition to the arterial hypertension resulting from intestinal stasis and that resulting from foci of infection of long standing.

5. Focal infection doubtless plays a part; however, removal of foci of infection does not give satisfactory cures. Doubtless infection makes the condition worse but is probably never the primary cause. All foci of infection, such as abscessed teeth, infected tonsils, infected gall-bladder, etc., should be removed for hygienic reasons and to prevent an aggravation of the existing arterial hypertension.

6. Obesity is an endocrine disturbance. The patient who is obese and shows a low basal metabolic rate often has a high systolic blood-pressure. However, the patient who has a pituitary deficiency often shows a subnormal blood-pressure. This is in keeping with the endocrine theories of the control of blood-pressure. Since the pituitary is antagonistic to the thyroid it is probable that obesity does not cause a very high blood-pressure, but that obesity is produced by the same endocrine disturbances which cause disturbances in blood-pressure.

7. The presence of "pressor substances" in the blood, which produce a generalized constriction of the arterioles or capillaries or both. This produces an increased resistance to the peripheral circulation.

8. Hardening of the arterioles and capillaries. This is ordinarily termed arteriosclerosis of the peripheral vessels. It may be produced

by a long continued action of "pressor substances." These "pressor substances" are an unknown entity. We feel sure that they are present; yet we do not know what they are, how they are formed or their mode of action. It is probable that they act by stimulating the vasoconstrictor center in the brain; there may also be a peripheral stimulation of the musculature of the small vessels. However, since a long continued arterial hypertension is accompanied by arteriosclerosis, and since this sclerosis apparently begins in the smaller vessels, we would assume that the action is primarily on the brain center, inasmuch as the brain center controls the smaller vessels rather than the large vessels. There is doubtless a very strong endocrine factor in the formation of these "pressor substances."

9. *Endocrine:* "Pressor substances" may consist of an abnormal secretion of the thyroid or gonads, or they may be an oversecretion of the suprarenal glands which have lost the inhibition normally supplied by normal thyroid and gonads.

Englebach studied a group of 500 endocrine cases; all these showed a systolic pressure of 160 or more. However, he adds the comment that just what relation ductless glands bear to these types of hypertension cannot be determined.

Arterial hypertension is usually accompanied by a definite endocrine disturbance.

Addison first called attention to hypertension apparently resulting from deficient secretion of the suprarenal glands. Yet attempts to raise pressure by administering the suprarenal extract have never been very satisfactory.

It is probable that the thyroid gland is antagonistic to the suprarenal glands. This has been an unproved theory for many years. More recently Plummer has noted an incidence of arterial hypertension in thyroidism. The gonads are synergistic to the thyroid and apparently have a considerable influence in determining blood pressure.

My attention was first directed toward the endocrine aspects of arterial hypertension by a patient who came under my care several years ago. Both ovaries and the thyroid gland had been removed. Following this she had had no medical treatment. When I saw her she had a systolic blood pressure of 260, and had continuous headaches and very severe dizziness. Her basal metabolic rate was thirty. Premature artificial menopause had followed the operation. I put her to bed for a few days and gave her substantial doses of thyroid and ovarian extracts. There was a rapid reduction in blood-pressure so that within a few weeks her pressure was practically normal, and it remained normal as long as she remained under my care.

After about one year of treatment she left the state and stopped all treatment. About a year later she returned to North Carolina and was very active in supervising the furnishing and arranging of a new home. When I saw her, she had had a cerebral hemorrhage and was unconscious. Her blood-pressure was 280/120. She never regained consciousness.

Women are particularly likely to show a slight elevation of blood-pressure with every menstruation and in normal pregnancy and meno-

pause. In abnormal menopause, the blood-pressure may vary from normal and reach a very high elevation. The same is true in pregnancy in which eclampsia develops. Eclampsia, however, is merely uremia occurring during the course of pregnancy. The first "symptom" of eclampsia is high blood-pressure. Uremia is a symptom of severe nephritis in which there is considerable toxic retention in the blood. Now, it does not matter what is the cause of high blood-pressure so far as the kidneys are concerned. No patient can show a high blood-pressure over a long period of time without developing renal damage; so whether the patient be a man, a non-pregnant woman, or a pregnant woman, the result is likely to be uremia.

In eclampsia the blood-pressure is high and there is a considerable blood retention of metabolites. In menstruation, menopause and pregnacy, the ovaries are the endocrine glands which are most affected. An enlargement of the thyroid is frequent during menstruation in general and particularly during the adolescence; and enlargement also occurs during pregnancy. The thyroid is synergistic to the ovaries and its enlargement is probably compensatory in these cases.

Polack states that "A rise in blood pressure is almost always a forerunner of eclampsia and is the most important premonitory sign which precedes by many days the toxic picture in either blood or urine."

A great many women who present high blood-pressure give a history of scanty menstruation, frequently of sterility, and of having been rather overweight and of the endocrinopathic type as small children.

In consideration of arteriosclerosis, we must differentiate between sclerosis of the large vessels and sclerosis of the peripheral vessels. Tuberculosis apparently can give sclerosis of the large vessels, but this is rare. Just as we consider essential hypertension an advanced stage of simple hypertension, it is probable that we may sometimes consider arteriosclerosis of the large vessels an advanced stage of arteriosclerosis of the small vessels. Whenever we have arterosclerosis of the small vessels we always have arterial hypertension, unless cardiac decompensation or some other condition prevents. However, whenever we find sclerosis of the large vessels, even though it be of the pipestem type, tortuous, and possibly locomotor arteries, the blood-pressure may be high, low or normal. The condition of large arteries does not appear to have any influence upon the systolic pressure.

Some diabetic and gouty patients, as well as some patients with syphilis, develop arteriosclerosis and at times arterial hypertension, but it is probable that in these cases we have also an endocrine disturbance which is responsible for the arteriosclerosis, the hypertension, and the obesity so often present in diabetes and gout.

Arteriosclerosis of the small vessels causes arterial hypertension, and it is probable that long continued arterial hypertension will produce arteriosclerosis of all the vessels. Sclerosis probably begins in the smaller arterioles and capillaries, and if long continued may spread to the larger arteries.

RESULTS OF ARTERIOSCLEROSIS

Arterial hypertension causes cardiac hypertrophy. If long continued the condition progresses, and under the excessive load the myocardium

weakens. The high pressure gives an early renal damage. The glomeruli are designed for work at low pressure, and when the pressure is raised to abnormally high limits they are no more able to stand the increased pressure than the radiators in an office building could stand the steam pressure of a locomotive. Chronic glomerulonephritis is the inevitable result, due to sclerosis of the glomeruli along with the capillaries of the entire body.

If the hardening of the vessels continues and pressure remains high, the lenticulostriate artery of Charcot is usually the first to suffer, and apoplexy is listed as the primary cause of death. If the damage to the vessels be not so severe, there may be a generalized hardening of the cerebral vessels resulting in a dementia. This may be present with no apparent sclerosis of the large vessels. If the pressure remains high the weakening of the myocardium results in a myocardial degeneration, and cardiac decompensation is likely to follow.

THE BLOOD IN HIGH BLOOD-PRESSURE

The blood picture in arterial hypertension depends entirely on the renal conditions. If the kidneys have not been severely damaged, the blood may show a normal nitrogen content. When the kidneys have become damaged sufficiently to impair their function, the nitrogen retention increases in proportion to impairment.

It is doubtful if renal insufficiency ever produces arterial hypertension. In support of this belief it is necessary only to study a few cases of prostatic hypertrophy with retention of urine. Such patients often show nephritis, and if the condition be sufficiently severe there is an extremely high nitrogen retention in the blood. But the blood-pressure is not elevated above the usual level for the individual patient. These patients, above all others, with their long continued and often massive retention of waste products, could be expected to show arterial hypertension, were arterial hypertension due to impaired renal function.

TREATMENT

The important factor in the treatment of high blood-pressure is its prevention. The prevention must begin in childhood. Whenever we see a small child who is fat and pudgy, answering to the description of Dickens's fat boy, we are dealing with an endocrine type of child. This is the child who later in life may develop arterial hypertension.

We must get away from the time honored fallacy that blood-pressure should be 100 plus the age, and consider that any blood-pressure above 120, 130 or 140 is distinctly pathological, and demand just as much care, consideration and study as a temperature above 100. No physician would be likely to tell a patient that a temperature of 102 does not make any difference and is probably normal for that patient, yet many physicians tell a patient that a pressure of 150, 160 or 170 is normal and is not worthy of any consideration.

Remarkable progress has been made with fevers, but what about blood-pressure? How much more do we know about blood-pressure than the great physicians of a generation ago knew? True, we can make an accurate estimation of the amount of pressure, and we can plot curves

to show the relative variations due to the action of drugs, posture, exercise, etc. But what results are being obtained? The subject of blood-pressure has not received the study that has been given to fever and other symptoms of disease. Until we secure more definite data regarding the cause, our treatment will remain unsatisfactory.

Patients who show a moderate elevation of blood-pressure probably do not have very much, if any, arteriosclerosis unless they have had a higher pressure and are suffering from circulatory decomposition. These patients can be benefited most. Their arteries have not become sclerosed but are merely under the influence of a toxic contraction which affects all the arterioles and capillaries of the body. At this time treatment is of the greatest value. Study and treat any endocrine disturbance which may be present; carefully remove all foci of infection and determine whether or not diabetes, gout or syphilis is present; eliminate any possible influence from mercury, lead or zinc intoxications; and a patient can be benefited and often cured. But if the warning signal is not heeded, and blood-pressure is allowed to progress to a higher level and the arterioles become sclerosed, nothing can ever cure the patient.

A great many patients who have a moderately low basal metabolic rate do not show much evidence of thyroid deficiency on physical examination. Many such patients show an elevation of the blood-pressure. From studies and observations made so far it appears that deficiencies of the thryoid and gonads are primarily responsible for arterial hypertension. It is probable that this type of case presents first hypertension and then arteriosclerosis. In the various intoxications, as metals and infections, we probably get arteriosclerosis first and hypertension follows.

Endocrine cases probably offer the best field in which to obtain good results. Supplying the endocrine deficiency seems to be the principal part of the treatment. I have not used any severe restriction of diet. I pride myself on never using cardiac depressants and vasodilators. I have used some of them in the past, but the results were far from satisfactory. I can not get away from the fact that in any case of hypertension we have a physiological aberration from normal. If you had a horse that was pulling a heavy load, had pulled it all day long and then got into a great mudhole in which the wheels mired up to the hubs, it would be useless to apply the whip. The heart is overloaded, frequently working to full capacity with no reserve. Most of the drugs ordinarily employed for reduction of blood-pressure depress the heart. This prevents the heart from doing the work necessary to maintain life. In arteriosclerosis we are dealing with scar tissue, which represents an effort on the part of Nature to protect and repair injury just as truly as in the case of skin burns. When dealing with a case of high blood-pressure that is old and has progressed to the stage of arteriosclerosis, the odds are too much against the patient. A return to normal is just as impossible as of scar tissue in the kidneys, skin or elsewhere.

It is unfortunate that we have so little actual information regarding the cause of high blood-pressure. However, we may be certain that arterial hypertension is the essential factor. Before the development of arteriosclerosis a patient can be cured. While the vessels are becoming sclerosed there is still opportunity to cure or at least to benefit the patient to a great extent. After the vessels have become completely scler-

osed it is probable that any lowering of the blood-pressure is effected primarily by depressing the heart. It is impossible to secure a relaxation of a sclerosed arteriole or capillary. So the great factor in the treatment of arterial hypertension, regardless of the cause, consists in prevention of arteriosclerosis.

While endocrinopathic cases predominate in arterial hypertension, we must watch for all foci of infection, all avenues for toxic absorption, worry, mental strain, and anything else that could contribute to the process of hardening of the arteries.

NOMINATION OF CHAIRMAN

Dr. Verne S. Caviness, Raleigh, nominated Dr. W. D. Rodgers, of Warrenton, for recommendation to the president as chairman of the section for the ensuing year. This nomination was seconded by Dr. C. P. Parker and carried unanimously.

SECTION OF MEDICAL VETERANS OF THE WORLD WAR AND MEDICAL OFFICERS' RESERVE CORPS

CHAIRMAN: JOHN W. MACCONNELL, M.D., Davidson

CHAIRMAN'S ADDRESS

WHAT MODERN MEDICINE OWES TO THE MILITARY SURGEON

JOHN W. MACCONNELL, M.D., Davidson

While there is no absolute line of demarcation between surgery and medicine as practiced in civil life and that practiced in war, we feel that so many procedures have been applied in war surgery and later used in civil practice and life that the title of the paper is justified.

Gathering large masses of men together and enforcing certain standards of living upon them has made it possible to deduce certain facts from established lines of treatment. Soldiers are fed alike, clothed alike, housed alike, and put under identical habits and living conditions, so that it is fairly easy to get uniform data on the results of operation and treatment or sanitary practices. Study of large camps in peace time gives an unusual opportunity for the scientific worker to observe and corroborate data. It is natural that many valuable contributions to our knowledge have come from field and camp, for where a man works without thought of monetary reward and where he does not have to consider the personal equation, his work is often of greater than ordinary value.

As I sketch rapidly some advances in modern medicine due to the enterprise of military surgeons, your minds will fill in many blanks with names and achievements equally worth remark.

The sketch naturally divides itself into three headings: (1) Contributions to early surgery and medicine by the military surgeon. (2) Benefits to present-day surgery from recent military practices. (3) Advances in the study of epidemiology and sanitation introduced by military surgeons.

Early military surgery as practiced on the wounded had little of encouragement, for in days of hand to hand battle the wounds were mostly head wounds and the mortality high. The percentage of killed has always been the highest when the weapons were the crudest. When a man seized his opponent by the beard and commenced the encounter, it ended only when one party was killed. We find surgeons attached to all ancient armies and given some military rank, with small pay. Yet sound military advice seems in some measure to have prevailed. The Ramayana, a Hindu epic, 250 B.C., says in regard to first aid: "The wounded in battle should be quickly picked up, carried to a tent, the bleeding stayed and upon the wounds should be dropped an anodyne oil with the juice of healing herbs." Quite like a page from a modern manual.

The outstanding surgeon of the sixteenth century is Ambroise Paré (1509-1590), originally a barber, who furnished new proof that not the

most learned but almost exclusively the most gifted have accomplished revolutions in the department of medicine. He adopted the pious motto, which ought today to be particularly recalled to remembrance: "Je le pansay, Dieu le guarit." Moreover, in practical life he followed the precept: "An approved remedy is much more valuable than one newly discovered," and that other maxim which bears witness to his eminent character and his scientific spirit: "He who becomes a surgeon for the sake of money and not for the sake of knowledge will accomplish nothing." This character he preserved as well in the hard school of life and on the slippery field of the royal court, a model of the upright, courageous and frank Frenchman of the olden time. Like many great surgeons down even to the nineteenth century, Paré stepped from the barber-shop to his studies and acquired the elements of his special knowledge in the Hotel Dieu. But he was also a great surgeon in war, the best school of surgery, in which he passed a great part of his life. He is said to have decided to pursue surgery from witnessing a case of lithotomy. As early as his nineteenth year, after becoming a barber-surgeon, he enlisted as such in the army of Marshal Monte-Jan, during whose campaign the accidental want of hot oil suggested to him his first and most important surgical reform. In the campaign of the year 1552 he employed the ligature in amputations. Soon after his return he was appointed one of the twelve royal surgeons. Paré died full of years and highly honored by his nation, in spite of the fact that he was decried by the literati of his day as an ignorant upstart and plagiarist. In his native place, however, during the present century, a well merited monument to his honor has been erected.

Besides the eminent services already mentioned Paré merits further credit for the following improvements in surgery. He discarded the frequent dressing of ulcers and castration in the so-called "radical" operation for hernia. He performed herniotomy in strangulated herniae (most probably only at the suggestion of Franco); though this operation was often performed, too, in his day by itinerant herniotomists. He was the first surgeon to habitually employ trusses, though this instrument was already known to antiquity. Paré also taught how to recognize induration of the prostate and fracture of the neck of the femur. He introduced the operation of staphyloplasty and an improved method of trepanning with the crown-trepan and invented numerous instruments, including feeding bottles for artificial nourishment. He performed bronchotomy and employed the ligature in the treatment of fistula in ano; healed wounds of the nerves; circumscribed the employment of the actual cautery, particularly in operations for cancer of the breast; revived the operation for harelip with the figure-of-eight suture, in which he was the first to follow the Arabians and Pfolspeundt; was the first to perform direct excision of the so-called "loose cartilages" in the joints; and was also acquainted with abscesses of the liver resulting from injuries to the head. Paré likewise improved the medico-legal doctrine of mortal wounds; practiced amputation of the leg at the point of election; taught version by the feet; etc. (Baas's History of Medicine.)

Another barber-surgeon was Thomas Morestide, who was ordinary surgeon to three English kings, Henry IV, Henry V, and Henry VI. He was likewise chief surgeon of the expedition mentioned above and

was required to equip fifteen men, three archers, and twelve surgeons. His salary was forty pounds a year, or twelve pence a day; while his archers and assistant surgeons received twenty pounds a year, or sixpence a day. Morestide was also allowed a share of the prisoners and booty. (Baas's History of Medicine.)

No noteworthy advances were made in the century following these men which we can attribute directly to the military surgeon. The technic of amputations and the use of the cautery was about the same.

Our early colonial wars and the Revolutionary War gave us little help. Lack of anesthesia hindered any real progress. The Director General of the Continental Army received $4.00 a day and seems to have been overpaid, as he was discharged for treasonable conduct.

Civil War surgery properly belongs to modern medicine, and the surgical and medical records of both armies show that there were men of skill and resource in the service of both sides and that the proper honors of war were given to surgeons when captured. They were generally left to continue their work and were later paroled or exchanged. The lack of drugs, noticeably quinin, was one of the most serious handicaps to the South. Open treatment of wounds was the rule, and "laudable pus" was present in all cases. Gangrene and tetanus were common, but tetanus hardly so frequent as would be expected. The large caliber lead bullet of this period produced extreme shock. The casualties of this period were almost all from small arms fire; and comparatively few wounds were made by artillery. The intensity of small arms fire in one or more Civil War battles exceeded that of even the World War, and the destruction by rifle fire at Cold Harbor and Fredericksburg was appalling.

Medical service in the Spanish-American War is covered by another paper on the program. The scandal and graft in the service of supply hindered the medical efficiency, but the great monument to modern medicine is the work of Reed, Carrol and Leazar in the yellow fever work in Cuba. This is probably the outstanding medical event of the modern era, for it has made possible the building of the Panama Canal and enabled the white man to live safely in tropical regions. All this work has a distinct effect on the health of the world as a whole. Smallpox caused 7,000 deaths in the Civil War and only 14 in the World War; not owing, it is true, to anything originated by any army medical officers, but it shows the effectiveness of vaccination. The invasion of Canada in 1775 was unsuccessful on account of the smallpox epidemic.

Col. Russell's work with typhoid vaccine is epochal. In the Spanish-American War we had 20,000 cases in 108,000 men; in the World War we had 2,000 cases in 2,000,000 men. In fact, nine-tenths of all deaths in troops in 1898 were from typhoid. In the first Balkan War, 1912, the failure of the Bulgarians to capture Constantinople was due to dysentery, 30,000 cases appearing in one day. Disease can easily check even a modern army as malaria checked Hannibal in the Punic War against the Romans.

The campaign against social diseases has been carried on vigorously by medical officers, and we find a lower venereal rate among soldiers than among men of like age in civil life. Those parents who have feared that camp life would expose their sons to a venereal peril have been surprised

to find that the disease rate at home is higher. The wonderful work of Col. George Walker around the war sections in France made a record which was astonishing to our allies.

In the late war we have made *some* progress in treating infections by the Carrel-Dakin method, *much* progress in plastic surgery, some in the treatment of meningitis; and in all fairness we must agree that much of modern progress in preventive medicine has been due to the energetic work of the medical officers of the world's armies and navies.

DISCUSSION

Dr. J. Howell Way, Waynesville: I had hoped that Dr. Boyette would be here and read his paper because there is one thought on sanitary lines that I wanted to mention in connection with it, and that is with regard to the extraordinary development of our knowledge of the prevention of typhoid fever and the diarrheal diseases since the war of 1898. When I saw he was listed to present this paper I took down the report made by Drs. Walter Reed, Vaughn and Shakespeare, of the United States Volunteers "of typhoid fever in military camps of the United States during the Spanish-American War." Naturally my special interest was in the old First North Carolina Regiment, which was, you gentlemen recall, made up of the North Carolina Militia, we called it then, or the North Carolina State Guard. It is listed in that report as having had a mean strength of 1164 men. In camp at Raleigh in May, 1898, they were free from fever and from diarrheal attacks. Their official records show in the mean strength of 1164 men 36 "febrile attacks, malarial, etc.;" 46 cases "probably typhoid", and 147 "certain typhoid", a total listed as "229 cases of fever, including probably typhoid, certain typhoid, and long malarial attacks".

Since then antityphoid vaccination and sanitation have changed all of that. The few cases of typhoid fever that I saw in the United States Army in 1917 and 1918 were limited exclusively to recent arrivals from civil life. Some of those got on record as typhoid fever, and some of them didn't. You will recall that it was necessary to have a laboratory diagnosis in order to properly record typhoid fever during the late war. However, it was not necessary to have a laboratory diagnosis in order to properly treat the boys who had typhoid fever. So it is simply a corroborative illustration of the interesting paper read. I merely wanted to mention this to emphasize the very great development that has gone on in the practice of army sanitation and prevention of typhoid fever since 1898.

While I am on my feet I wish to make one suggestion in regard to a thought developed in the chairman's address; that the friends at home were needlessly alarmed by the dangers of social disease incurred by their sons going into the army. I had occasion one evening after an experience of more than a year in the service to submit some remarks in one of the churches in a nearby city. There were a number of ministers present, and I told them I wanted to give them a word of gentle admonition to go on preaching war; that preachers had always been very clever and sincerely patriotic about preaching war in time of war and they would with equal intensity preach peace in time of peace and in the main advocate "unpreparedness"; but when nations are in trouble,

history has taught us that none could be depended on to preach war, vigorious war of the pronounced Shermanic type, more than the Christian ministry, and I appreciated that because if you want to fight you have to fight to win. I said that that is all right, that we wanted them to go on, but I added "For God's sake and for the sake of the truth, do stop this talk about the Lord protecting Billy and Jimmy and Bobby from social disease infections and the moral pitfalls in service in the army."

And then, Major McBrayer, I referred to your experience in the social disease examination of the first troops that were mobilized at our camp in the summer of 1917. The major (or lieutenant he was then) and myself were there when the first troops came, and they were the center of attraction, for hundreds of cars bearing thousands of people went out to camp to see what fine young fellows they were. After three or four days our C. O., an experienced regular army man, ordered a special examination in which Lieutenant McBrayer acted; with the result that a day or two later the visitors from the city were astonished and the editorial column of the leading daily newspaper in the city "outraged at the military dominance and the rigors of the military rules that were beginning to be inflicted on the boys, in that around 40 per cent. of those gentlemen were lined off and not allowed to receive visitors".

I told my friends about that and compared it with the report for the previous month, October, 1918, of the A. E. F. We showed, from our experience with the State guard troops fresh from home and mother and Sunday school and going to church every Sunday and all the other moral opportunities that civil life was and is supposed to afford in protecting the young men as contrasted with active duty in army life, that the incidence of infection in the A. E. F. was less than one-twenty-fifth the previous month of what it was in Lieutenant McBrayer's work!

Of course, in time of peace there is a let-down in the morale of the army and a rise in the incidence of this type of disease. But I just want to emphasize the fact that the sanitation of the United States Army and the efforts to prevent the social diseases not only evoked our admiration but impress us with the literal fact that the so-called "hard-boiled" military medical officer, as is evidenced by the comparative results attained, actually takes better care of the morals of the youth entrusted to his care than do the folks at home.

Dr. J. M. Templeton, Cary: It was not my good fortune to get into the Spanish-American war. But I did get into the World War, and I was camped for two months (during the term of the medical officers' training school) on the old battlefield of Chickamauga where, during the Spanish-American War, there were 20,000 soldiers congregated. I state the figures approximately. Among those 20,000 troops there during the Spanish-American War, 4,000 contracted typhoid fever; and of this number, if I recall correctly, some 1100 died. As I said, I was on that same battlefield practically in the same spot where those soldiers were encamped. There were some 30,000 or 40,000 men congregated there, and in all that assemblage I don't remember to have seen or heard of a case of typhoid. There were a number of cases of typhoid among the German prisoners that were corralled there, and I thought it was a disgrace to the American Government that those German

prisoners were not protected in the same manner that the American soldiers were. A wave of indignation swept over the 1500 medical men there when the lieutenant of a German ship interned at Norfolk died in our hospital of typhoid.

I went from there to the base hospital at Camp Sevier. I did not see the statistics there, but it was common talk among the surgeons that 50 per cent. of the cases in the ward were venereal. I could not say where they came from—civil or military life, but there was in my ward a large proportion of venereal cases. I think there is no question that the army had great influence in protecting young men from venereal diseases, but as to whether or not it was a moral affair I am not certain. As Dr. Way and everybody else knows, there was an attendant there in the prophylaxis tent and whenever a fellow was exposed he had to be disinfected and a preventive used. So however rotten his morals might be, the physical man was all right.

Dr. C. S. Lawrence, Winston-Salem: I am veteran of four wars, still I live. The progress that has been made in medicine and surgery I think we shall all agree has followed wars. Your paper brought that out very nicely, Mr. Chairman. We are slow to grasp the advantage we get in civil life from men who work and produce things that are uplifting and beneficial to the human race. It seems as though we must have a catastrophe, a national catastrophe, to impress these things upon the public.

I was in the army during the Spanish-American War. When the Maine was blown up in Havana Harbor on the night of February 14, 1898, I was at Fort Wadsworth, New York, and my company was ordered to camp at Sandy Hook, New Jersey, February 15, 1898. At that time there was not a modern gun at Sandy Hook that could be fired. There was not a round of ammunition for each gun on the Atlantic Coast when the Maine was blown up. There were not enough medical supplies in the United States to outfit a base hospital. The people were crying, Why not declare war? but President McKinley knew the conditions and held it off until we could get enough medical supplies to take care of the sick in a fair way.

The New Jersey volunteers were ordered into service at Sandy Hook in 1898, and I remember very well seeing them unloading from the troop train equipped with old equipment that came from the Civil War—the old-fashioned Springfield rifle which held just one bullet in the magazine. They went into camp at Sandy Hook, and they had not a single sanitary protection—not one. I remember that the kitchen was simply a hive of flies, and the men in the kitchen didn't have experience enough or equipment enough to feed the men properly. That was in 1898. Of course the Spanish-American War lasted only one hundred days, but we had thousands and thousands of casualties from gastro-intestinal diseases.

Then we began to learn a little something about what we had forgotten. The campaign in the Philippines took on real activity at about that time; then the Boxer uprising in China came on, and we had to send a lot of troops to China. By that time the men were pretty well seasoned. I went to China with the troops in August, 1900. The campaign from Taku to Pekin was over low land which had been dry for

two or three months, and the dust was very deep. We were along the Peiho River, and the men had to drink out of the river, which was full of corpses. By the time the men got to Pekin there were a number of cases of diarrhea and typhoid fever. We were the First Military Hospital quartered in what was called the Temple of Agriculture in Pekin. It was a Chinese building with soft brick floors and a kind of a papier-mâché wall on the outside. It made rather comfortable quarters, and the men got along well.

Then winter came on, a very cold and severe winter. There was an awful lot of dust; the respiratory diseases started, and the wards filled up with pneumonia. Our mortality in pneumonia at that time was very, very high. I don't remember just what the percentage was, but it was high. Through the winter the men were very comfortable. We had an abundant supply of food, which was obtained from the local market at a very low cost, and the men were very happy and contented during that time. We had lots of games and horse racing, baseball, football, etc., and the men had a very good time in Pekin during the winter.

In the spring a legation guard of 100 men was left, and the rest of the troops were sent either home or to the Philippines. I was one of the men who went to the Philippines. That was the ending of Aguinaldo's campaign in 1900 and 1901. It was in the latter part of 1900 that Funston captured Aguinaldo in the northern part of Luzon. That was really the end of the active campaign in the northern part of Luzon. General Henrici was General Number Two of the Philippine army and had charge of the southern division of the insurrection army in the Philippines. I was with the troops that captured him in the southern part of Luzon in 1901. That really ended the formidable campaign in the Philippines. After that it was guerrilla warfare, which was really harder on the men than the active campaign. Groups of troops would have to go out in the mountains after the insurrectionists and probably be out for two months without even blankets to sleep on. They had to sleep on the wet ground, and they always came in with what we call dhobie itch. That itch is due to tinea imbricata, and I have seen the men actually covered from head to foot. If you have ever had it you will know that it is awful. Really, the only pleasure they got was scratching. The only cure for it is a saturated solution of salicylic acid in alcohol. About one or two applications will cure dhobie itch. It was the only thing that helped it. We tried iodin, but this was the only preparation that did any good. The men came in with dhobie itch and then malaria and dysentery. I have seen the men come in with temperature of 104 and with ten or fifteen stools a day, passing blood, having been that way for a week or two in the hills.

With all of that, then, they had an epidemic of Asiatic cholera. It started in 1902 in the city of Manila and spread over the southern part of Luzon. Case after case of Asiatic cholera was found dead in the streets of the town. Men were taken sick in the morning and by the middle of the afternoon would be dead with Asiatic cholera. We got that under conrol pretty quickly. We isolated all cases, boiled the water and cleaned up the town, looked after the natives and established camps for them, taking personal charge of them, and pretty soon the epidemic was under control.

It was not until 1902 or 1903 that Dr. Russell of the American Army experimented with a company of engineers at Washington, D. C., by giving them typhoid inoculations. That was the first time that typhoid inoculation was used. He sent these men out in camp that summer along with other troops that had not been vaccinated, and the incidence of typhoid fever among the men inoculated was nothing. The disease existed in quite a large per cent. of those that had not been protected by inoculation. That established, I think, for all time the protection against typhoid by inoculation.

Then came the work of Walter Reed, James Carrol, Jesse W. Lazear, and Aristide Agramonte in yellow fever, which really put our country and the world on a rational medical protective basis.

Dr. R. S. McGeachy, Kinston: Six years ago this month I and two other officers were sent to Camp Jackson to examine the students at the student officers' training school. There were young men in that school from every college in the country from Virginia to Mexico. There were men there from every one of the coast states. There were some 2,000 or 2,500 attending. (I am making this statement to the credit of the colleges.) Out of that number we did not find one single case of venereal disease. Two of the physicians were not North Carolinians, one being from New York and one from Kentucky or Tennessee, so there was no reason in the world for hiding anything like that. But of all those men there was not one single case of venereal disease. We examined everyone within the first week of his admission. They ranged in age, from sixteen to twenty-three or twenty-four, most of them being juniors and seniors in colleges.

Dr. R. McBrayer, Shelby: What is the venereal disease incidence in colleges?

Dr. J. W. MacConnell, Davidson: It is very low. I am connected with only one institution, but the venereal rate there is very low. In over 600 men at Davidson College there are fewer than a half-dozen a year. All the men are examined, of course, when they come to college; and none are admitted who have any active venereal disease.

Dr. John Wesley Long, Greensboro: I think we ought to be just a little cautious in saying things in an organization of this kind that would seemingly reflect upon the moral training of the youth of our state. I don't think my friend Colonel Way really meant to do that; but if what he said should be published in the papers or go out to the country at large, it would sound like a reflection upon the churches, Sunday schools, and homes of our communities. We should remember that we medical officers, those of us who went into service, who examined the boys and helped to enforce the army regulations regarding these boys, are a part of the Sunday schools and churches and homes; therefore we are talking about ourselves when we say things that deprecate the moral training of our youth. These young men are the product of our own training; they are our sons, our neighbors, members of our own churches, our Sunday schools and our colleges. Therefore I don't think that we should pat ourselves on the head as army officers and say what smart folks we are, so superior to the social and educational institutions of our land, simply because of the fact that when we had these men tied up in the army, like slaves as far as discipline is

concerned, we were able to force them to keep venereally free, or at least more so than when in civil life. The facts are that our boast is true only in part. Our soldiers, despite army prophylaxis and short-arm examinations, were not entirely free from venereal diseases. You know, just as well as I, that in every big camp there was a great hospital section set aside for the treatment of soldiers with venereal diseases. There was at Camp Upton, for instance, where 60,000 troops were in camp, a venereal section that looked big enough to house an entire division; and it was usually full in spite of all our discipline and prophylactic precautions. Secretary of the Navy Josephus Daniels in a speech in Chicago stated publicly that there were enough men tied up with venereal diseases at that time he was talking to man two great battleships, not only with the crews but with marines. Therefore I think officers of the army ought to be careful not to say anything that could possibly be interpreted as a criticism upon the home training of our young men. We know after all that it is the moral support we get from our churches, Sunday schools, homes, and colleges that make the type of men that go into the army. This training furnished the background for what we accomplished not only in Pekin, the Philippines and on the Mexican border, as described so graphically by Col. Lawrence, but also, I may add with patriotic pride, for our glorious triumphs with the A. E. F.

Understand me, please, I am not criticising what Colonel Way said. He is too wise a man to deserve criticism from any source; but I do want to utter the aforesaid word of caution, that we may not estrange the public by reflecting upon the home training of the American youth.

There is another reason. You know the country is going through a critical period at this time. There is a great deal of propaganda being broadcast everywhere, some of it openly and some of it insidiously, against war. "Peace, not war" is the slogan of these misguided people. Of course we feel that they have the wrong idea about the thing. They say that those of us who believe in time of peace we should prepare for war go around with a chip on our shoulder looking for a fight. They assert that we are stirring up trouble all the time by our very preparedness. You know Wilson contributed mightily toward winning the World War by the propaganda he distributed all over Germany by airplane and otherwise. Therefore I don't think we ought to say or do anything that would in any sense give offense, and the best way to keep the other fellow from criticising us is not to criticise him. I think we ought to seek all the moral support we can get from the public at large.

Yes, I am proud of what our army and navy have accomplished, and I am also proud of the type of young men that the schools and homes and churches and colleges of North Carolina have produced.

Dr. Chas. O'H. Laughinghouse, Greenville: The thing that impressed me as much as anything else in the army, I believe, was two occasions. Down at Fort Oglethorpe, at Camp Greenleaf, the son of a Philadelphia woman died, and she came down and built a memorial hall in his honor. Welsh and Vaughn and many other prominent men were there at the dedication of this particular building. The Commanding General of Chickamauga and Welsh and Vaughn were evidently in the Spanish-American War. Welsh and Vaughn, along with other men, gave to General Gorgas all of the encomiums and eulogies that

could possibly come from men to another man. They also took up the condition at Chickamauga that Dr. Templeton mentioned, and it was wonderfully comforting to me to see these men talk to the Commanding General just the way men would talk to men. The Commanding General at that time (I mean at the time of the Spanish-American War) was one of the officers of that war. Dr. Welsh had been down and had condemned certain wells, stating that they were infected with typhoid fever. The Commanding General of Chickamauga, during the time of the Spanish-American War, came up behind Dr. Welsh, drew water from the open wells and drank it in order to set an example to his soldiers and to say that those fool doctors didn't know what they were talking about. If you could have heard Welsh blister the Commanding General and scorch him, and if you could have heard Gorgas pass his approbation, it would have made you feel that the medical corps of the army was beginning to come into its own.

When in France after the armistice I let myself get interested too much, perhaps, in going through the cemeteries in and around Paris. One Sunday afternoon I saw any number of old men, grandfathers and great-grandfathers, with little boys and little girls, seven, eight, and ten years old. They would bring these children up to the tombs of the French patriots and, although I could not understand all they said, evidently delivered talks to those children which convinced me were putting into them a certain amount of patriotism and love of country. I saw twenty-five or thirty boys and girls in front of Larry's tomb. Some old man was telling them, as enthusiastically as though he were twenty-five, evidently what Larry had done for France, and as he finished his lecture those kids came to attention and saluted Larry's tomb. To me it was the finest thing I ever saw. I would rather have brought that back to the youth of America, that spirit of respect and love and obligation and admiration for men like Larry, than to have brought back anything I found in France; and nobody came back from France with keener admiration or reverence for the French people than I did.

I want to take a middle ground and try to make my two friends Dr. Way and Dr. Long get a little closer together. I had a little experience in the army, not much. With my own outfit, when it came to venereal disease I took this plan to care for them. I told them what venereal disease is and its dangers and said to them: "Men, I am not preaching a sermon to you. If the respect you have for your mothers and your sisters and your wives and sweethearts has not already put it into you there is no use for me to try to drive it into you now. The only thing I have to say to you is that whether you are moral or whether you are immoral, you have got to be physically fit. Here are some cards. They give you the address of every prophylactic station in the city of Paris. I hope you will have no occasion to use them, but in event you should be weak enough to need them, keep the cards with you just as you would keep your emergency ration if you were going on a long march. There is a prophylactic station at the gates of the hospital that is open twenty-four hours a day. It is there for you. There are in the drug stores in Paris certain instruments of protection known as the Chapeaux Anglais. You can get them for a franc. If you will not take the advice

of your mothers and your preachers and your doctors, take the advice of your commanding officer and protect yourselves physically against anything that may happen to you."

I remember these two lines from a negro's sermon to his congregation: "We leaves de summer time to God and de winter time to you." That is very much like the condition that the soldier is in when he comes into the army. I know that Colonel Way, like Dr. Long and myself, has an abiding faith in religious uplift and the potentialities of religious effort and what religious effort has accomplished. I know there is not a man in the world who has a deeper veneration for the sacredness of the home than he. But he feels that home and church training needs to be augmented by discipline when men get into the army, so that they will have to take care of themselves. I believe that in war time the best thing to put into the minds of all soldiers is that God helps those who help themselves, and I think Dr. Way was trying to get that idea across.

SO-CALLED SHELL SHOCK IN CIVIL LIFE

Reuben McBrayer, M.D., F.A.C.P., Shelby.

An unexpected call to Philadelphia prevented my preparing a paper, so I have an apology to make to you.

I should like first to refer to the previous paper. We have talked about the social diseases in the army, or our handling of those cases in the army; we have talked about the men and their moral fiber as we saw them in the army. I have been interested in the last two years as I have gone about in inquiring rather generally to find out from the doctors themselves, when a man comes in to them, how many of them are approachable and are willing to administer to that man and give him a competent prophylactic. I don't find that there is one doctor in twenty-five that I have come in contact with that does it, that is approachable, that is willing to help the men. Instead of feeling that administering a prophylactic is encouraging the men in moral laxity, I feel it gives the doctor an opportunity that he would get in no other way. In the first place you must be approachable. You must be the young man's friend. The opportunity lies in your being able to come directly in contact with the boys of no particular social level, with the boys who don't know or who don't realize the dangers to which they are exposing themselves; and right there in that office to tell them that you know of no prophylactic that will prevent puts a different appearance on the whole story. I am not in favor of letting him believe you can prevent venereal disease, for two reasons: In the first place it is wrong to believe it; in the second place it is wrong to mislead him into thinking you can when you can't. I have had men walk into my office or telephone me and ask if I will give them a prophylactic. Then and there I have done more good, I think, in putting the fear of venereal disease in their hearts, as well as explaining to them and coming in personal contact with these boys, than I ever possibly could have by all the lectures I gave in the army. So what we learned in the army can be brought home and used just as it was used in the army, only in a very personal way rather than under the heading of military rule and discipline.

The points that I had in mind bringing out about shell-shock in civil life were some I had been turning over in my mind for quite a while. The first one is that if we had it to do all over again we would never say "shell-shock," for many boys displayed and had that unstable nervous system which under stress and strain would break—not necessarily because of a bursting shell or injury of that kind, for many of the boys very probably (if we bear in mind the definition of shell-shock) were shell-shocked though they were never under shell fire. So it is rather embarrassing to the boy who has never been under shell fire to say he is shell-shocked. It makes him think (at least it makes others think) that he is somewhat of a piker.

The second thing is this: That state is sooner or later going to show itself, it is my opinion, in these boys and in these women and men as we see them in civil life. We see that a patient has a vascular system that can live, can survive so many things; then it eventually can not withstand the pressure to which it is subjected, and that patient gets apoplexy. If that patient would live an ideal life, apoplexy would undoubtedly be forestalled for from twenty to fifty years. I think our nervous system can be placed with our vascular system. It can be placed with our kidneys. Something is going to wear out when it is subjected to a certain amount of stress and strain. To live subjects one to stress and strain which over a period of twenty or thirty years would be comparable to three years in the army. So I think that there is a congenital (a hereditary, if you want to say) make-up in these boys and patients we have that at least predisposes or allows them to get into this class called shell-shocked. I am thinking that maybe careful study of calcium metabolism and phosphorus metabolism may enable us to do something concrete for these cases. It is just an idea; I don't know.

The third thing I had in mind is this: When we read about shell-shock, in about ninety-nine cases out of a hundred we are reading about traumatic neurosis, of course. It seems to me that the involuntary nervous system can just as well be shocked or traumatized by medical conditions as it can by injuries.

There is one suggestion I should like to make. That is that we pay more attention to traumatic neuroses that follow or come in the footsteps of medical injuries, as for years we have paid attention to those cases of so-called shell-shock or traumatic neuroses that follow in the case of injuries, be they incurred in civil life or be they incurred in actual military war.

MEDICAL RESERVE OFFICERS' CAMPS

H. A. Newell, M.D., Henderson

Medical Reserve Officers' Training Camps are conducted at several places each year to enable civilian physicians, who feel that in case of great national emergency it will be their duty and desire to go to the aid of our country, to assemble in groups and receive systematic instruction from carefully selected instructors in the things that it is essentially necessary for them to know when called to active duty in an emergency. The main object of training at these camps is to direct the

attention of the student officers to the subjects that are of most importance, in order that the time they devote to study of military literature during the year following may be used to the greatest advantage. The length of the training period of a camp is necessarily short, and therefore it is important that the training be intensive. Officers are expected to take the work seriously and do their best. Much thought has been given to the arrangement of suitable programs. A suitable program may be said to be one which will give sufficient time for work and study and also provide for the necessary rest and recreation. It is a well recognized fact that in order to get busy doctors to leave their practice and go to training camps the camps must be made attractive and the period must have something of the appearance of being a vacation for them. At almost all of the camps sufficient amusements are provided for.

It is assumed that Medical Reserve Corps Officers will read and become familiar with the elementary things at home. The time spent at training camps is devoted largely to study of their duties in the field. There they are instructed in such things as the function of the several Medical Department units, such as the regimental medical detachments, collecting companies, ambulance companies, hospital companies, evacuation and general hospitals. The kind and amount of equipment available in each is explained, and its use. In preparing the training schedule for my regiment, the 105th Medical, we make it progressive throughout the year, winding up with the summer encampment. During the first part of the period the company commanders are allowed to use their judgment about strengthening up weak points in their outfits. They then work with the other companies, and the camp training ends with a field problem in which they all participate. This is the plan suggested by the Militia Bureau.

The mission of the organized reserves, as defined by the committee of the General Staff (Committee No. 2) was stated as follows: To provide a trained, organized and balanced force which may be readily expanded into an adequate war component of the army of the United States to meet any major emergency requiring the use of troops in excess of the Regular Army and the National Guard. Therefore you can easily see that it is not enough that an officer have some military training himself; but he must also be familiar with the best training methods for troops, because in case of national emergency it may fall to his lot to organize and train units made up of drafted men. Army Medical Bulletin No. 18, on "Principles and Methods of Training," has recently been published at the Medical Field Service School at Carlisle Barracks and is the best guide to training methods that can be had at this time. The most important function of all units during peace time is training, for their efficiency depends on the character and thoroughness of their training and on their being kept trained. He who would succeed in training must also know the art of war. A good training program must be simple, complete, balanced, progressive, and logical. Each commanding officer is held directly responsible for the discipline, training, and general efficiency of his own unit.

For convenience military training is divided into base, technical and tactical training. The agencies of training are drills, schools, prac-

tice marches, field exercises, etc. Colonel Applin said: "The first point in military training is that you must begin on the bedrock foundation of discipline, or it is useless to start. You cannot start any form of military training until you have that to build on." All training must be progressive to the point of mastery. The ultimate training objective in every organization is the highly coördinated team work of all the elements of the unit for its special functions in peace and war. It is well to state a standard of proficiency that is complete, clear, specific and that means the same thing to the training officer and inspector.

It has been said that "troop training without a constructive inspection system is aimless, leaderless, and barren of results". Inspections are instructive to the inspector as well as the inspected. They are the most effective means of insuring that the unit and individual do reach the prescribed proficiency standards. They promote healthy rivalry. They determine what methods used are getting the best results. All officers should be trained as inspectors, and the training of each officer along these lines should begin as soon as he enters the service. Every officer is under obligation, as a part of his duties, to develop and train his subordinate officers. Training order No. 81-W, 1924, provides for a plans-and-training officer for the medical regiment, which is the only unit of the Medical Department having one. He assists the regimental commander specifically in the training of his troops. This is considered one of the most important recent changes in the medical regiment and may be expected to materially increase its efficiency. He is also intelligence officer.

From the office of the Surgeon General we are told that the present plan devised in anticipation for mobilization for service in event of emergency calls for a total of approximately 32,000 medical, 5,200 dental, 2,800 veterinary and 4,500 sanitary and medical administrative reserve officers. On June 30, 1922, the number of officers in the Medical Officers' Reserve Corps was 10,953. On May 15, 1926, the number was 17,092. It is estimated that five per cent. of these officers attend training camps each year.

From a report on the Reserve Officers' Camp at Carlisle Barracks for 1925 we find that about 260 reserve officers of the Medical Department took their training at the Medical Field Service School July 5-19, 1925. Every section in the Medical Department Reserve (namely: medical, dental, veterinary, sanitary and medical administrative corps) was represented. The officers came from the five Eastern Corps Areas. The first medical regiment was used as a demonstration unit. The early part of the camp period was devoted to basic military instruction, with special reference to the organization of the infantry regiments and its medical service. This was followed by a field exercise. Next followed the study of the organization and medical service of the infantry division, followed by a division maneuver in which instructors explained the working of each echelon of the medical service. The class was divided into three sections. The first section was composed of officers assigned to medical regiments; the second section of officers assigned to other divisional units, and the third group comprised what was known as the command and executive group and included the commanders, adjutants and executive officers of Medical Department units. These offi-

cers were given special instruction in the subjects of mobilization and training, which included conferences on the basic laws, regulations and plans of mobilization, and preparation of training orders, programs and schedules, also field orders and administrative orders incident to combat, the making of sanitary surveys and the preparation of sanitary orders. The report says that the chief aim and purpose of the course of instruction was the preparation of the reserve officers as organizers and instructors of the units for which they will be responsible in the event of mobilization.

We must ever remember the importance of sympathetic coöperation between the Medical Reserve Officers' Corps and our friends in the regular establishment. We can be mutually helpful. Each has his difficulties, and by working together in earnestness and frankness we can overcome many of them. It sometimes happens that we hear or read criticisms that are not for our common good. The reserve officer should remember that the regular officer has selected the service as his life work. He is excusable for being a little jealous of an "outsider" of about his own age who comes into the service temporarily with rank equal to or greater than his. And the regular officer must remember that his classmate of a few years ago has been working to improve his talents, too, and that when he goes into the service in emergency he is upsetting the plans of himself and his family. Frequently an established practice suffers beyond repair.

DISCUSSION

Dr. G. G. Dixon, Ayden: As the Colonel remarked, we are still far below the expected quota in organized reserve. All of us remember that as a government a democracy is the best kind of peace-time government, but as a war-maker a democracy is a failure. We should also take into consideration that until the millennium is reached, when there shall be no more wars, we must at all times be partially prepared for the inevitable. I don't believe that there has ever been a man who has gone through war that could be labeled a militarist. There may be such animals, but they are very few. We know as an organization of men who have been through it that it is something to be feared, yet the best way to prevent it is to be prepared for it.

This group or section in the North Carolina Medical Society is very small as compared with the remainder of this society. Not all of the members of this group are members of the organized reserves; not all the members of the organized reserves take an interest in this little meeting. That is something that we as members of the organized reserves should promote. We should promote the work of the organized reserves because it is only through the organized reserves that we can reach the general public, the men that are to be soldiers of the next war; for whether it be in our day or in the days following us it is sure to come. If we allow our opportunity to be prepared to go by, when the emergency arises we shall be in practically the same condition as we were in 1917.

There is one other thing I should like to say in reference to Colonel Way's and Colonel Long's discussion. Now Dr. McGeachy remarked that in the student officers' training camp, made up of college men, they were physically and mentally good. But I should like to call Colonel Long's attention to the fact that there is a very small percentage of the men that

will be called for the next army who will be college men. I would also call his attention to the fact that home training is the best possible training that we can have with the exception, perhaps, of church training. I would also like to call his attention to the fact that the majority of men that are called for service will have neither home nor church training, for the simple reason that the future can only be judged by the past. It looks to me as if that is the one big work for the medical section of the reserves to do. It is our privilege and should be our duty to scatter abroad the knowledge that we have acquired of our people in the past. Colonel Long and Colonel Way and Dr. Laughinghouse have lived and had their being among the people of North Carolina, and yet they were shocked and surprised to find the physical condition of the men that were drafted into the service in 1917. You had your eyes opened, why shut them? You know these things, why keep them to yourself? You have failed; you have fallen down on the job; you have literally lain down on the job when, whether or not it be pleasing to the public, you have not given the facts to them, in no uncertain language. Until the majority of our boys are college-bred men, we must look out for them and take care of them. Until the majority of our fathers and mothers are college-bred, trained men and women, we are going to have a class of men and women who are not physically developed, who have not training in what is morally right and wrong. The army cannot make morals, but it certainly can control immorality. When there are things that you can not make right or wrong, then it is up to us to do the best we can to control them. I should like to see this section grow and expand not necessarily in numbers but certainly in the influence that we have on the rest of the fraternity in North Carolina.

Dr. M. L. Townsend, Raleigh: May I express one of the things that has come to my mind this morning? In the medical section of the North Carolina Medical Society there are over a thousand members, and twenty-five per cent. of them have seen service, yet there are only a dozen of us here in this section. I think there is some reason why all of these other men, who should have just as much interest in this section as we have, are not here. I am wondering what that reason is. Of course lots of them are saying: "I am fed up on that sort of thing. I don't want any more of it. If there ever comes another war and I have to, I will go into it, but I don't want any more of it."

Now there comes up this other feature. When we go to camp, or when we join our officers' reserves, we are doing just as much, I believe, as when we wore a uniform all the time. It takes more patriotism, perhaps, to stand up for our country in time of peace than it does in the excitement of a campaign, and I wish that we could do something that would interest these men. I wish we could put before them the advantages that come to them by joining the Reserve Officers' Association and of making this section ten times as big as it is now.

Dr. J. M. Northington, Charlotte: How on earth does Dr. Townsend assume that men are going to be in attendance on the other sections, besides attending to all the politics of the association, and still be in attendance at this section? It can't be done. If you can induce the rest of the society to adjourn and allow this section to have full sway for the number of minutes that it is in session, it may be brought about.

But we might as well look at it from the other side. Some of them are in the surgical and other sections which are a regular part of the society. I don't know how this is going to be adjusted, but it certainly is true that it isn't necessarily through a lack of interest that the men aren't here.

CHAIRMAN MACCONNELL: I think that Dr. Northington is right. A great many would like to be here but are more concerned about other matters.

DR. TOWNSEND: I was really talking about going to the camps and getting the benefit of the camps for our citizens every day. The disturbance in the adjoining room prevented my saying what I had in mind. When I said I wish we could do something to make this section ten times as big as it is now, I was thinking of the matter in the sense that I wish we could do something that will impress on all service men the advantages to themselves, the state, and the nation of affiliating themselves now with the reserves. Upon the organized reserves the state and nation are relying for protection, not only when war comes again but also to combat the insidious foe of bolshevism and unpatriotic men now. The need to show on which side we stand is to-day imperative. Besides all this, by affiliating now the individual is permitted many opportunities for self-improvement by the courses of study in camp. Furthermore, now while there is time for deliberation the individual may secure assignment to service where he can serve best. If for no other reason, the one reason of obviating the square pegs in round holes is justification for joining the reserves. The man who says, "When I am needed I will go," forgets that he is needed now and that when in an emergency he does go he may again find himself serving in a line of work foreign to his inclination. I wish all these points could be brought to our fellow officers and members of this society, that they may see the advantage of the reserves. Seeing this advantage they will gravitate toward this section.

CHAIRMAN MACCONNELL: Concerning summer camps, those who are at this camp at Carlisle Barracks have found it profitable and pleasant. There are some excellent teachers and some mediocre. I think Major Darby, who teaches there, is about as fine a teacher as I have ever sat under. Any of you who want to go to the Field Service School at Carlisle, if you file applications now, will be sent there for two weeks begining July 4, or later if you want. I will say that I had a greater respect for the reserve corps when I went there, because I saw men there whose time was so much more valuable than my own and whose ability marked them as leaders in the profession. I thought if those men could come there and stay two weeks and find it profitable, surely a small-town man like myself would find it more profitable; and I did find it so. I think more of you would go if you knew exactly how pleasant it was at these camps and how profitable the training might be.

DR. NEWELL (closing the discussion): There is nothing I can add to it, except to call attention to the fact that in case of an emergency those officers attending camp will find themselves much better prepared for the duties that will fall to their lot; and those who haven't been attending will find so many difficulties that they will wish they had prepared themselves.

MEDICAL RESERVE CORPS OFFICERS OF THE ARMY OF THE UNITED STATES RESIDING IN THE STATE OF NORTH CAROLINA AS OF JUNE 15, 1926.

(Reported from the Office of the Surgeon General, United States Army, Washington, D. C.)

Name	*Rank*	*Address*
Abel, Joshua Fanning	Major	Waynesville
Alexander, George	Capt.	Asheville
Allan, William	Lt. Col.	Charlotte
Anderson, William Banks	1st Lt.	Haw River
Arnold, Laurie James	Major	Lillington
Barksdale, Geo. Edward	Major	Asheville
Blake, Jos. Franklin	1st Lt.	Chadbourn
Bowers, Mervin Arthur	Major	Winston-Salem
Boyette, Eli Crawford	Major	Charlotte
Brace, Bobert Walter	Lt. Col.	Oteen
Bullitt, James Bell	Lt. Col.	Chapel Hill
Byerly, Wesley Grimes	1st Lt.	Sanatorium
Campbell, Alton Cook	Capt.	Raleigh
Candler, Chas. Zachariah	Major	Sylva
Carrington, Geo. Lunsford	1st Lt.	Durham
Carter, Paul Conway	Major	Madison
Caviness, Verne Strudwick	1st Lt.	Raleigh
Chapin, Wm. Burdette	1st Lt.	Pittsboro
Clinton, Roland Smith	Major	Gastonia
Cooke, Grady Carlyle	1st Lt.	Winston-Salem
Craven, Thomas	Capt.	Huntersville
Crawford, Wm. Jennings	1st Lt.	Goldsboro
Cutchin, Jos. Henry	Major	Whitakers
Daniels, Ralph Livingston	Capt.	New Bern
Davis, James Wagner	Lt. Col.	Statesville
Davis, John Isaac	Capt.	Oteen
Dixon, Geo. Grady	Capt.	Ayden
Dosher, Julius Arthur	Major	Southport
Dodd, Benj. Roscoe	1st. Lt.	Wake Forest
Dunn, Wm. Leroy	Col.	Asheville
Dyer, John Wesley	Capt.	High Point
Easley, Philip Samuel	Major	Statesville
Fenner, Edwin Ferebee	Major	Henderson
Ferguson, Robt. Thrift	Lt. Col.	Charlotte
Folsom, Theo. Winslow	1st Lt.	Asheville
Fox, Powell Graham	1st Lt.	Raleigh
Gouge, Arthur Edward	Capt.	Bakersville
Hahn, Milton	Major	Asheville
Hall, Price Barringer	Capt.	Pembroke
Hardy, Ira May	Major	Kinston
Hartnack, Knud	Major	Oteen
Hartsell, Joe Albert	Capt.	Concord
Hathcock, Thos. Alex.	Major	Norwood

Name	*Rank*	*Address*
Herbert, Wm. Pinckney	Lt. Col.	Asheville
Hoggard, John Thomas	Major	Wilmington
Holmes, Andrew Byron	Capt.	Fairmont
Holt, Duncan Waldo	1st Lt.	Greensboro
Huffines, Thos. Ruffin, Jr.	1st Lt.	Asheville
Hunter, Wm. Blair	Major	Gastonia
Ivey, Robt. Robbins	Major	Asheville
Jarboe, Parran	Capt.	Greensboro
Johnson, Otis Hackett	Lt. Col.	Morehead City
Johnston, Wiley Warren	Capt.	Manteo
Jones, Beverly Nicholas	Capt.	Winston-Salem
Justice, Zoro Knox	1st Lt.	Davidson
Kerr, James Edwin	Capt.	Winston-Salem
Kerr, John Daniel	Lt. Col.	Clinton
Lawrence, Charles Solomon	Lt. Col.	Winston-Salem
Leinbach, Robert Fred'k	Lt. Col.	Charlotte
Long, Glenn	1st Lt.	Newton
Long, John Wesley	Col.	Greensboro
McBrayer, Reuben Adolphus	Major	Shelby
McCabe, Jos. Levering	Capt.	Elizabeth City
McClellan, Jay Harlee	Major	Oteen
McKay, Hamilton Witherspoon	Lt. Col.	Charlotte
MacConnell, John Wilson	Col.	Davidson
MacRae, John Donald	Lt. Col.	Asheville
Maxwell, Clarence S.	Major	Beaufort
Maxwell, Henry Byrne	Capt.	Whiteville
Miller, Oscar Lee	Major	Gastonia
Morrow, Wm. Columbus	Capt.	Andrews
Myers, John Quincy	Capt.	Charlotte
Nash, John Frederick	Capt.	St. Pauls
Newell, Hodge Albert	Col.	Henderson
Newton, Howard Lowell	1st Lt.	Charlotte
Ogburn, Herbert Hammond	Lt. Col.	Greensboro
Palmer, Marion Cherigny	Major	Tryon
Park, Wm. Edwin	Lt. Col.	Biltmore
Pate, Frederick James	Major	Greensboro
Person, Hector McLean	Capt.	Goldsboro
Poole, Claude Terrel	Capt.	St. Pauls
Ray, Ritz Clyde	Capt.	Beaver Creek
Rich, John Calvin	Capt.	Candler
Robinson, John Daniel	Major	Wallace
Saliba, Michel	Major	Wilson
Saunders, Jos. Hubbard	Major	Williamston
Schaffle, Karl	Major	Asheville
Scruggs, Wm. Henry, Jr.	Capt.	Asheville
Shafer, Irving Everett	Capt.	Salisbury
Sherrill, Coite Long	Lt. Col.	Statesville
Small, Victor Roy	Major	Clinton
Spence, Geo. Sigars	Capt.	Oteen
Strosnider, Chas. F.	Major	Goldsboro

Name	*Rank*	*Address*
Tatum, Walter Low	1st Lt.	Salisbury
Taylor, James N.	Major	Burlington
Terry, Geo. H. B.	Major	Oteen
Thompson, Edgar S.	1st Lt.	Winston-Salem
Tompkins, Raymond L.	Capt.	Oteen
Townsend, Maurice L.	Col.	Raleigh
Toy, Calvert Rogers	1st Lt.	Chapel Hill
Tyner, Carl Vann	Capt.	Leaksville
Warner, Henry Herbert	Major	Raleigh
Way, Jos. Howell	Col.	Waynesville
Webb, Marcus Lafayette	Capt.	Andrews
Wheeler, James Hartwick	Capt.	Henderson
Whichard, Murray Parmer	Capt.	Edenton
Whitaker, Paul Frederick	1st Lt.	Kinston
Wilson, Newton Graves	Major	Hendersonville
Withers, James J.	1st Lt.	Davidson
Witherspoon, Bartlett J.	Capt.	Charlotte
York, Hugh Brantly	1st Lt.	Williamston

NOMINATION OF CHAIRMAN

On motion of Dr. J. M. Northington, Dr. C. S. Lawrence, of Winston-Salem, was nominated for recommendation to the president as chairman of the section for the ensuing year. Dr. G. G. Dixon was elected as secretary of the section.

SECTION ON PUBLIC HEALTH AND EDUCATION

CHAIRMAN: R. L. CARLTON, M.D., Winston-Salem.

CHAIRMAN'S ADDRESS

THE HEALTH DEPARTMENT

R. L. CARLTON, M.D., City Health Officer, Winston-Salem.

The prime objective or function of a health department is the prevention of disease and the promotion of health. With this in mind the governing boards of most of the cities and many of the counties in North Carolina have made possible the establishment of organized health departments. By organized department is meant one in which the corps of workers of even a minimum number is sufficient to apportion the various activities of the department—a division of labor. A department of health may be just as truly an organized department with a staff of four as if its working force consisted of twenty-five or more. The best insight into the workings and aims of a health department will probably be secured by considering the various divisions of the department, with an outline of the work and methods of procedure of each.

Division of Vital Statistics. This, of course, refers to bringing together, tabulating, filing and studying the birth and death certificates of the community. Unless the births and deaths are recorded a source of much valuable information is lost. Vital statistics serve as the bookkeeping of the health of the people and the growth of the community. In some communities the office of the registrar of vital statistics is separate from that of the health officer, and consequently the health officer has no accurate way of knowing the number of births and deaths that are occurring nor the deaths that may be due to the various diseases. Where these two offices are combined the arrangement is fortunate; there is the opportunity of studying the number of births, the number of deaths, the causes of death, and the distribution of deaths according to age, sex, color, occupation, etc.

If the reporting of births, deaths and cases of disease is inaccurate and incomplete it will be impossible to calculate the true death rate and to determine which diseases are the greatest menace to the population; and it is likewise impossible to intelligently and effectively organize a force of prevention, that diseases may be fought and overcome. Should the money appropriated for health work be spent in preventing nuisances due to garbage and manure or in protecting the milk supply? Should funds be set aside for preventing infant deaths, typhoid fever, malaria, tuberculosis, pneumonia or other diseases, for housing inspection, for food-store inspection, or for some other phase of public health work? Only by an analysis of complete and accurate vital statistics can one determine the activities which claim the public funds and the amount of money which should be spent in each direction.

It is a pleasure to note that the vital statistics work of North Carolina, largely made possible by the members of this society, stands high in the opinion of the Bureau of the Census of the Federal Government.

Certificates of births and deaths are, as a rule, satisfactorily filed in North Carolina. It is our opinion that practically all deaths are recorded; and, judging from North Carolina's position at the head of the column, with the highest birth rate, most of the births must be recorded too. It may be of interest to you to know that a much larger percentage of the birth certificates filed call for extra work in the office of the registrar than do death certificates. It seems, judging from the large number of little inaccuracies found, that birth certificates must frequently be very hurriedly filled out. An omission often noted is the date of birth. A frequent inaccuracy is found in the date of birth and in the names of parents or baby. Another very frequent occurrence is the omission of place of birth, whether at home or hospital; a few certificates are filed without the signature of the physician. Of course every inaccuracy and omission means a telephone call, a letter or a visit by one of the health workers to the busy doctor's office. The same inaccuracies and incompleteness, only to much greater degree, are found on the certificates filed by midwives. In many instances a visit of investigation must be made to the midwife and the mother before the necessary information for a correct certificate of birth can be secured.

The time of filing certificates is of interest. Death certificates, as a rule, are filed promptly. The law specifies that no body must be interred until a permit has been secured from the health officer. This permit can not be issued until the death certificate, properly completed, has been presented—therefore very little delay is encountered in securing death certificates. This can not always be said, however, in regard to birth certificates. The law specifies here that birth certificates shall be filed within five days after birth has occurred. Not more than one-third of all certificates are filed within the specified five days; about half, sometimes more, are filed at the first of the month covering the previous month; some birth certificates are delayed several months, and sometimes more than a year goes by before an occasional certificate is filed and recorded. As a whole, however, our births and deaths are finally accurately and completely recorded to the satisfaction of everyone concerned.

Division of Communicable Diseases. The health department is only carrying out its duties in regard to the requirements of the laws of our State and the city in which located when it insists that communicable diseases be reported in writing within twenty-four hours after a diagnosis has been made. This reporting within twenty-four hours is not always done; in fact the instances in which such early reporting is not done are rather frequent. The list of comumnicable diseases is familiar to every physician; and there should be no hurt feeling when the department insists on having reports which are due it, not only by courtesy but by law. Such reports should be studied immediately; the regular report of the case transmitted to the State department; tabulations and indexed files should be made in the local office of all reports received. Such action is taken by the department as is necessary in the nature of the case reported. In response to a case report of most communicable diseases a nurse visits the home of the patient, placards the house, assists in the establishment of proper isolation of the patient and instructs the family with relation to quarantine, etc. Not that such instructions

have not already been given by the physician in charge of the case, for the health department assumes that the doctor has already instructed the family in regard to its proper management. But it is feared that he may not have done so, and in some instances it is known that he has not because rather often a doctor calls the health department and asks that the nurse give the necessary instructions concerning isolation, quarantine, disinfection, etc. For these reasons she is sent to visit.

The Health Department should be ready at all times to render any assistance possible in determining the correct diagnosis of a case of communicable disease. A doctor from the department should, upon request, visit the case in consultation with the physician in charge; the laboratory of the department should assist by examining cultures, smears, specimens of blood, sputum, etc.; cultures for diagnosis should be taken, upon request by a nurse from the department; any thing that can possibly be done to assist the doctor in determining accurately what disease he has found should be done. After diagnosis has been established, it should be the policy of the department that any specific preventive treatment that may be available for others who have been exposed shall be given and administered by a member of the department if requested. This does not mean that a nurse should administer diphtheria antitoxin nor tetanus antitoxin, for the nurse should not be permitted to do this; but she may and does with perfect propriety administer smallpox vaccine and typhoid vaccine.

Upon advice from the physician that the case has recovered, quarantine and isolation restrictions are removed, in most instances without a visit by a physician member of the department. The exceptions to this are: in cases of smallpox and scarlet fever a doctor from the health department should visit all cases before release; diphtheria cannot be released until two cultures from nose and throat taken on successive days are found to be negative. These cultures should all be taken by a nurse or doctor of the department upon request.

Tuberculosis is the disease for which most delayed reports are received. There seems to be great hesitancy upon the part of most physicians to report this disease or an inclination to delay the report so long that no activity of the department can possibly benefit the patient. Many of the reports of tuberculosis received are of patients whose death certificates reach the health office within a few days of the disease report, if, indeed, the death certificate does not come first. A nurse should visit all cases of tuberculosis unless there is a request by the physician to not visit. Such requests should always be respected.

Division of Public Health Nursing. If a system of generalized nursing is being carried out the city or county will be divided into districts in each of which one or two schools may be located. The territory should be so arranged that every school is visited daily by a nurse. In addition to the work incident to that school visit she does the communicable-disease work in her territory, visiting, placarding and instructing. She visits the reported cases of tuberculosis in her district unless requested by the physician to not make such visit; she visits those persons who have been exposed to tuberculosis or those families where there has been a tuberculosis death; she makes as many prenatal visits as time will permit and visits postnatal cases upon suggestion from family or

physician that such visit is desired. If there is a sick baby in her territory she visits him if possible—her duty in the case of sick babies being purely advisory or in the nature of assistance in helping carry out the doctor's orders. More frequently she does greater good by advising and urging mothers who have not done so to call a physician to see a sick baby or one not progressing and developing as it should. It should be the policy of the department, and the nurses should be so instructed, that nurses may not diagnose a case; that they may not order treatment; that all cases are to be sent to the family physician, the dispensary or the school physician.

All during the year the nurse keeps a watchful eye upon the babies and young children in her district, and in the summer her work with them is intensified by the establishment of a baby health station and milk stations.

The health department realizes that the work of the nursing division—prenatal, infant care, pre-school age, school nursing, communicable disease control—is a vital part of the program of public health.

Division of Baby Welfare. It should be the policy of the department that the program of child welfare shall be one of preventive medicine only and that remedial medicine and bedside care shall be left to those physicians whose proper duties they are. We insist that the work of the baby-welfare division is to discover and prevent conditions which adversely affect the child's well-being; and, when such conditions are discovered, to call the attention of the parents to them with such suggestions as may cause the prompt seeking of medical attention.

In trying to carry out such a program, as much prenatal work as possible should be done by the nurses as they come in contact with expectant mothers in their rounds required by school follow-up visits and in communicable-disease control. Much good advice is in this way passed on to mothers, and much splendid literature from the Bureau of Child Hygiene and other sources may be distributed.

Midwives. In this connection it is desired to mention midwives and their work with this end in mind; that they be placed under a system of such instruction, regulation and supervision that some of the large number now doing business in North Carolina may be eliminated and the remaining number be enabled to perform a higher class of work. That this may be done the active interest and coöperation of every physician in the state is urgently needed and desired. Most of our health departments are not in position to deal with the midwife situation as it deserves to be handled. Some work along the line of supervision is attempted, but it needs to be greatly extended; and your help in bringing about a betterment of this situation is needed.

Baby Health Stations or Baby Clinics. For some years various departments have maintained baby health stations during the summer months to which mothers may bring their babies to be weighed, measured, and examined and to receive advice as to the feeding and general care. They are told over and over again that the slogan of the health stations is, "Let us help keep your baby well." The definite purpose of the health station is: (1) To keep the well baby well; (2) to direct the sick to the proper medical authority; (3) to supervise the feeding of the bottle-fed;

(4) to instruct mothers in the daily routine care of the baby; (5) to follow and examine the children no longer infants who continue to attend the stations.

It should be the policy of the department that babies found sick are to be sent to the family physician or to a clinic at the hospital, as the circumstances of the family permit. No sick babies should be treated at the baby health stations. Babies under care of the family doctor may be weighed and measured, but their mothers are expected and told to consult their physician when anything unusual arises in the baby's condition. The doctor at the station examines the child, advises concerning correction of defects, the supervision of bottle-feeding, and the handling of other questions which may arise concerning general care—but he should not treat sick babies.

In addition to the advisory care just mentioned, much practical work has been done in recent years by the nurses in teaching mothers how to properly prepare modified milk for babies and in actually preparing such mik in the diet kitchens of the departments and in the kitchens of the mothers. In this connection it is permissible to say that this diet kitchen service has been available for the general practitioners and has been used freely by them. Modified milk is prepared not only for babies whose parents cannot buy it and for whom it is supplied free of charge but for many patients of private physicians. The department should have it clearly understood that its policy in connection with baby station work is that this activity is available to the baby of any citizen regardless of financial standing. The health department wishes to keep babies well, if possible; and to this end this activity should be directed.

Division of Health Work in Schools. This part of health work is carried on by the school physician (whether he be part-time or full-time school physician or health officer acting in that capacity); a dentist, if possible; nurses (white and colored); and in some instances one or two special workers. The aim of this division is: (1) Health protection; (2) correction of defects; (3) health promotion. By health protection is meant watching over the sanitary conditions of school buildings and grounds, physical examination of school children and control of communicable diseases.

Two pieces of work which should be classed as control of communicable diseases in the schools are the administration of smallpox vaccine to all children who do not show evidence of having protection from this disease, and the administration of the Schick test, followed by three injections of toxin-antitoxin to all children whose parents request such service. The smallpox vaccinations are compulsory in most communities and should be in all. The diphtheria protective treatments are not compulsory, but parents should be urged by means of literature sent to the homes to have this work done; such service should be offered to all children, free, upon request. Corrective work should be done as may be necessary. Included under this heading is the dental clinic, which in some communities is jointly sponsored by county and city departments, a full-time dentist being employed. At this clinic prophylactic work is emphasized. Other work done includes treatments of abscesses

and dental cavities, fillings of temporary nature, and extractions. No gold fillings, bridge-work, or work of this character is attempted; and this service is limited to school children of ages up to thirteen, and is available to any child in this age group.

Included also under this heading is the work done in efforts to have enlarged diseased tonsils and adenoids removed. Scores of badly diseased tonsils are found every year, and everything possible should be done to convince the parents of such children that removal is of the greatest importance. Where financial circumstances permit, parents should always be advised to make their own arrangements with hospital and specialist for this work to be done. If parents are not able to pay the regular fees for such work the health department should render all the assistance it can in making some special arrangement for part pay or no pay at all, if deserving charity. The thing in which the department is primarily interested is the health of the child. For that reason alone it feels justified in occasionally requesting that some child have corrective work performed for which no one will receive a fee.

Regarding just who shall be recommended to perform tonsillectomies for school children it should be the well established policy of the department (and nurses and other workers should be definitely so instructed) that when inquiry is made of them as to what physician to secure to do this work they shall inform the patient that there are physicians who specialize in eye, ear, nose and throat work and that any one of this group is fully competent and recommended for such operations—no one being specified or mentioned as being preferable to others.

Under the heading of health promotion in the schools may be mentioned instructions given by teachers and nurses and the Modern Health Crusade, an organization having for its chief object the teaching and doing of good health habits. In some communities as many as 4000 white children of the lower grades are enrolled in this group, this work in some places being made possible by the tuberculosis Christmas seal fund. There should be mentioned in this connection, also, the work in nutrition which is being done in some communities. A trained nutrition worker pays special attention to the large group of children who are underweight and undernourished to the extent of being easy victims of disease if exposed to it. These children are taught just what and how they should eat, and as to sleep and rest, etc. Quite a number will be found who do not have a noon lunch and can't buy it. For these a warm nourishing lunch should be provided each school day, for which no charge is made. The lunches may be provided by the Red Cross, the Christmas seal fund, or the parent-teacher association.

These various activities of school health work should be under the direct supervision of the health department.

Division of Medical Service. This division, which ought not to engage in the treatment of diseases, will nevertheless have a large number of inquiring patients to direct to proper clinic, dispensary, outpatient department or private physician. The venereal disease clinic may or may not be an activity of this division. It is our opinion that it should not, but that it should be operated as a treatment clinic of some hospital or dispensary and the health department be concerned in the law enforcement end of the venereal-disease program and in educational

measures concerning it. The dispensary, of course, should not have referred to it the rather large proportion of inquiring venereally-diseased patients who are financially able to go to the private physician for treatment.

It is our opinion, too, that the treatment of charity cases—the city or county physician's practice—should be done by some dispensary, outpatient department of hospital or other agency than the health department.

The tuberculosis clinic is a function of this department and is considered an important item in the prevention of disease. The clinic's attendance is largely made up of persons who have been exposed to tuberculosis in a home where there has been a death from the disease, nurses bringing to the clinic those who were exposed. Some children are sent in from the schools. The attendance in most instances is not as large as it should be; patients do not fall over themselves to have a chest examination made even though they may suspect some trouble there. This clinic service should be offered to any citizen of North Carolina regardless of financial standing. It might be said, however, that in our experience practically 100 per cent. of the attendance is made up of persons who have not the money to go to a private practitioner's office for such examination.

Under this heading of medical service should be mentioned the administration of preventive vaccines and antitoxins. It should be the well established policy of the health department to offer to the public generally and to administer without charge smallpox vaccinations, Schick tests and toxin-antitoxin, typhoid vaccination, and pertussis vaccination; for antirabic vaccinations and tetanus antitoxin charges covering actual costs of vaccines being made. The administration of these vaccines is purely a matter of public health protection, hence the policy of freely offering them to any citizen.

All these vaccines and protective treatments should be distributed to physicians without charge for administration to charity patients and for a charge merely covering actual cost for administration to private patients. Some of this material, notably Schick test material, should be distributed free even though the department has to pay for its supply.

The department should keep constantly on hand for free distribution Wassermann blood test outfits, sputum cups and fillers, sputum containers for specimens, culture media, and silver nitrate solution outfits.

Laboratory Division. Every physician is familiar with the services offered by a well managed health-department laboratory, and every department should have its own laboratory if it is at all possible.

In addition to examination of specimens to determine the presence of communicable disease, such as diphtheria, typhoid, paratyphoid, gonorrhea, malaria, tuberculosis, Vincent's angina, etc., much work of a nature not directly concerned with communicable-disease control is frequently done; for instance, examinations of the various body fluids, blood counts, making cultures for organisms, making urinalyses, analyses of mother's milk, examination of water other than public supplies, etc.

For none of this work should any charge be made, although quite a large percentage of it may be for the assistance of physicians in their private practice. Other work of the laboratory is the routine examination and analysis of the community's water and milk supplies.

Division of Sanitation. A number of full-time employees, depending upon the size and needs of the community, should devote their time to the investigation of alleged nuisances and their abatement, to the enforcement of the sanitary privy law; to the securing of sewer connections where sewer is available, to fly and mosquito control, to supervision of proper disposal of waste and garbage, to guarding the watersheds from which the community's water supply is received, to inspections of housing conditions (especially in tenement districts), etc. Sanitary inspectors play no insignificant role in the public health program.

Division of Food Inspection. The protection of the food supplies of a community is a rather important function of a health department. Here, again, depending on the size of the proposition, there may be three or more full-time employees, as a dairy inspector, a meat inspector, and a food-store inspector, or there may be only one employee who combines the duties of all these. In other instances the health officer himself must do this work. Much work is required in seeing that the community's supply of milk is pure; that other foods, including meats, are wholesome and are handled and prepared in a sanitary manner; and that all food-handling places are sanitary and properly equipped and manned. In some communities in North Carolina 50 per cent. or more of the milk supply is pasteurized; and all milk, both sweet and buttermilk, comes from cows determined by tuberculin tests to be free from tuberculosis. The quality of our milk, meat and other food supplies and the equipment and methods of restaurants and other food-handling places are all in much better condition in every respect than a few years ago, before these activities were inaugurated.

Another activity which has helped considerably in the protection of foods and their being handled properly is the annual physical examination of food handlers by the health officer or some physician member of the department.

Publicity and Education. It should be the policy of the department, in so far as possible, to keep the public informed regarding conditions pertaining to public health and any service or activity of the department which might have a bearing upon public health. This may be done through monthly and annual reports, through newspaper articles, through literature distributed by mail and by hand, through posters and various educational exhibits in the schools, by talks (whenever opportunity is presented) to civic clubs, parent-teacher associations, etc. In all educational matter presented by the department, whether through newspapers, bulletins or talks, it should be the policy to present the positive side of health as well as to warn concerning disease conditions. In doing this the one theme always present should be that whenever any abnormal physical condition arises the family medical adviser should be consulted. The department should at all times and places emphasize the "keep well" side of health, advising and urging that every individual should be fully and thoroughly examined by his own private physician at least once and preferably twice every year. We have reached that

period in our public health existence when every one must realize that health educational measures must not depend alone upon the health department but that physicians generally have a very distinct part to perform. Dr. Wendell C. Phillips, President of the American Medical Association, in his presidential address at Dallas a few weeks ago had the following to say along this line:

"Physicians until recently have contributed insufficiently to public health education. To-day every licensed physician is being urged to prepare himself to teach his own patients the principles of health. Sufficient progress has already been made to warrant the statement that the field of public health education must and should be invaded by the physician. Organized medicine has approved this measure. The family physician must educate his patients and community in preventive medicine and be to some extent a health administrator. His chief role and his chief service will be to keep his patients well. Evidently, such service can be made possible only by maintaining intimate, clinical information, well recorded, regarding every man, woman and child who seeks his service. And every man, woman, and child in every community should have his health recorded in the files of his family physician. Too many of our inhabitants worry through life with only fairly good health; and, while they accomplish their daily duties, these fairly well persons may never know the exuberance and happiness of perfect health. Hence one goal of the future practitioner of medicine will be the attainment and maintenance of exuberant health, which is the inherent right of every person. A higher average of overflowing good health means a higher average of happiness, comfort, usefulness, and economic value of the individual. The superman will never materialize without superhealth."

We feel that results have fully justified the efforts made. More people are thinking in terms of good health to-day in North Carolina than ever before. Everyone at all interested in health is gratified by the position occupied by North Carolina. This state has the highest position of all the states so far as birth rates are concerned; and the death rate, while not the lowest in the Union, is one of which we are by no means ashamed, while individual communities in the state in more than one instance enjoyed in 1925 the lowest death rates in their histories. For this splendid record, you, the medical men of North Carolina deserve the lion's share of credit; and it is my privilege as one of the health officers of the state to thank you for your good work, your coöperation with the various departments and your sincere interest in all things pertaining to the advancement of public health. We ask a continuance of this coöperation of friendly and professional service; we ask that you use the departments in any way in which we can be of real service to you and North Carolina citizens generally. You have treated us very kindly during the past years of the organized health department's existence; you have forgiven frequent mistakes and shortcomings, for all of which we are grateful. We urge a continuation of this mutual working together for the good of the health of all the people.

MEDICAL SUPERVISION IN THE PUBLIC SCHOOLS

Charles T. Nesbitt, M.D., Wilmington.

When the State enacts a statute compelling school attendance it assumes the responsibility for the well-being of those affected by the law who attend the schools that are provided by the State. This responsibility is positive and inescapable. Its extent is, of course, subject to controversy; but there are requirements that are positive necessities.

School buildings must be provided which are conveniently located on sites thoroughly drained and large enough to furnish ample space for outdoor recreation. The buildings must be well constructed, commodious, well ventilated, properly heated, and kept clean. The furnishings must provide against postural faults and supply the aids necessary to successful teaching. There must be an ample supply of pure water for drinking purposes and facilities for minor bathing. There must be sanitary toilet arrangements for each sex. Teachers must be qualified by training and experience. The physical well-being of the pupils must be safeguarded in every practical way. For twenty years the quest for the practical in medical school supervision has been going on. Everything has been tried, from the occasional visit by the welfare nurse to elaborate systems of diagnostic procedure and expensively equipped school clinics for every sort of medical and surgical treatment. The practical lies somewhere between the two extremes.

The object of education at the public expense is to produce useful, self-reliant, and healthy citizens. To be successful it must develop in the pupil the ability to use his faculties to capacity in some useful way. In order to do this it must cultivate and conserve his physical efficiency. This is fundamental. As a generalization, there can be no well rounded intellectual development unless the vital functions are properly coordinated and meet the requirements of normal living. Millions of dollars have been spent in the attempt to educate those who are mentally and physically subnormal.

That our form of government may be consistent it must provide equal advantages for all. The mentally and physically defective child must have suitable opportunities for development. Our schools are now operated under standards of requirements that are graded below the average capacity in order to accommodate the small group of defectives that is in each class. The advancement of the majority of pupils is thus retarded. No doubt we shall ultimately see three types of schools in each local system, with educator-specialists in charge; but that time is far in the future. For the present we must meet the situation by providing an organized effort, in the hands of experienced physicians, to handle the medical problems of the public schools in a scientific manner. These problems may be enumerated in part as follows:

1. *Sanitation of School Buildings and Grounds.* School sanitation can be generalized only in a restricted sense. There are certain basic requirements, as I have already mentioned. In addition there are many conditions peculiar to locations, climatic changes, pupil groupings, etc., which must have attention.

2. *Communicable Diseases Occurring Among Pupils and the Members of Their Families.* Wherever people assemble in close contact there is a favorable opportunity for the spread of communicable disease. When the assemblies are frequent and the same groups come together, as in schools, the danger of infection is greatly increased. The communicable disease incidence in every community is governed by the epidemiological control that is exercised in the public schools. After long continued study and experimentation in contagion control I am confident that the physician in the school room, an efficient laboratory service, and the active conscientious field work of the public health nurse constitute the most successful protection that can be provided. In our state the school term will certainly be extended to eight months in the near future. This will give the epidemiologist ready access to the lower age groups through the months in which most such illness occurs. If he is vigilant in the use of this opportunity, his community can be assured of the greatest possible protection.

The apparently well disease carrier is the most dangerous element in the schools, and the discovery and exclusion of these is the result of special effort. Tuberculosis is not infrequent among young children. Out of one group of 368 undernourished children 47 were found to present active tuberculous infection. Parasitic and skin diseases often go unrecognized until they become widespread in the school and community.

Now that we can trace many disease conditions in the adult to recurring infections during infancy and childhood, these diseases of childhood have assumed very great importance.

3. *The Physically Defective Child.* The physical defects which retard school advancement are too numerous to discuss in this paper. Most of these defects are discoverable only by special vigilance. Visual, aural, dental, and throat defects are important, but the various forms of malnutrition, renal and cardiac impairment, and beginning nervous disorders are far more tragic when overlooked and neglected.

4. *The Mentally Defective Child.* This is the most difficult of all medical school problems. These cases may be roughly divided into two classes: Those with definite incurable pathology, who should be excluded from every public school, and those with pathology which is amenable to treatment. In the second group fall cases of faulty development of personality, which are by far the more numerous. The social and economic stresses which have so greatly increased in variety and intensity during the past two decades have produced serious effects upon child life. The mentally defective child is a rapidly increasing problem which must be met determinedly and sympathetically. It cannot be handled in the mass nor even in groups. It is a problem of the individual. Personality defects are found with increasing frequency now among children of the upper and middle classes. These defects, unrecognized and untreated in early life, produce the adult defectives who fill our correctional institutions. When there is no striking deviation from usual conduct, many remain at large to degrade society with their practices of moronic self-indulgence. This type rarely fails to reproduce

its kind, and from its procreative activities come those striking periods in the world's history when the dominance of the unfit causes general social revolution.

Great progress has been made in the past twenty years in the study of mental defectives. Methods have been devised for recognizing them. There has been a vast amount of writing and talk about them, much of which is visionary and impractical. Out of the study and discussion these dependable conclusions have emerged:

The existing state of our civilization is producing an increasing number of those who are defective to the extent that special effort must be made to secure for them an acceptable socialization.

The same conditions plus disease are producing an increasing number of defectives, incapable of socialization by any known method.

The heads of the families of origin of these defectives can not be relied upon to create the conditions requisite to their socialization.

The public schools offer the best opportunities for an effort to modify this dangerous situation.

The recognition, classification and handling of the mentally defective child is not possible as a part of the work of the teacher or the so-called social service specialist.

The three most important correctional measures known are: Proper treatment of existing pathology; discipline and instruction adjusted to the needs of the individual defective; and sustained religious influence.

5. *The Physical and Mental Well-Being of the Teacher.* The great demand for teachers has brought into the profession many who have a true vocation for the work, and more who are filling in between school life and matrimony or other hoped-for permanent objective. Since teachers have been required to attend collegiate institutions many have been brought under the influence of physical instructors whose work is supervised by physicians. The result is that we now realize that few professions subject their votaries to such severe physical and mental stresses as does the profession of teaching.

By far the greater number of teachers in the elementary schools are women. The age range among them is from seventeen to sixty. In the older groups relatively few have married and borne children. Those who have not done so deteriorate more rapidly than others. All women teachers present an accelerated rate of deterioration as the years of teaching increase; thus the more experienced teachers are less able physically. Most of the causes of teaching stress are unavoidable. There is but one way to meet them, and that lies in keeping fit at all times. Every cause for illness must be searched out and cured if possible. If serious disability exists teaching must be abandoned, for the sake of the school as well as the teacher. Women teachers are especially susceptible to functional neuroses, nutritional disorders, and gynecological conditions. Special medical supervision for teachers is of great importance.

6. *Health Instruction.* Teachers and pupils alike are usually instructed in the elements of physiology, hygiene and sanitation by those who are not qualified physicians. In recent years textbooks on these subjects for use in the schools have been written from the stand-

point of biology, covering the necessities for the conservation of life in the lower forms as well as in its human manifestation. This is a distinct advance. This sort of teaching lays the proper foundation for a useful understanding of the details of hygiene and sanitation, just as a course in biology makes possible a proper understanding of pathology in the education of the physician.

It is rare that either teachers or pupils are given any instruction by those who are qualified to extend both interest and information into the field of pathology, to the extent that such instruction may have a practical application in the technic of living. The result is that both teachers and pupils are equipped with just enough knowledge to prepare them for the acceptance of any therapeutic fad that can be fitted into their imperfect concepts. It is no longer intelligent to say that the less the layman knows about his mechanism and its diseases the better off he is. The layman is seeking and getting information about himself. The various therapeutic cults would be very quickly starved out if they had to depend upon the ignorant for patronage. They are supported most generously by the so-called better element, people who know something about their bodies and disease, but not enough to convince them there is no royal road to perfect health. Both teachers and pupils must be taught the natural history of disease by competent instructors if the highest good is to be obtained.

7. *Medical Supervision of Those Who Engage in School Athletics.* It seems to be assumed now that the best thing for every child is unrestricted athletic activity. The result is that we frequently encounter a child who has some defect or lesion, who is being more or less rapidly killed through participating in competitive school athletics. The lay physical director may possibly be better than nothing in the way of a check, but in my experience his very scant training and experience make him as much a menace as a protection. Like others of both sexes who have been merely sprinkled at the Pierian spring, he is prone to wander into the dangerous field of diagnosis and therapy. We of the medical profession must enter actively into the effort to find the practical way in which the medical problems of the school system may be solved. This is clearly our responsibility, and in justice to ourselves and to society at large we must assume the direction of this effort. If you will pardon me I will give you a brief account of my own effort to arrive at a practical method of medical school supervision in a large northern manufacturing center. Here I had the unique experience of having more money available for work than I could use wisely and effectively. This effort lasted through four school years, so there was time to arrive at some definite conclusions.

While this work proceeded I made personal investigations of the medical work in the schools of the large eastern cities and in a number of the midwestern cities and towns, profiting by their experience. I shall not take your time in relating the details of development but will give you the procedure at the close of my participation. There was still much to be desired in the way of improvement, but the results achieved at that time were quite gratifying.

To serve 37,000 pupils I employed six whole-time physicians and thirty-four registered nurses. At the opening of the fall term the school physicians made a rapid physical inspection of each child, from the sub-primary to the eighth grade. This work consumed most of the time of the first term. Each child had a physical record card upon which was recorded a brief personal history, with defect and illness data. The parents of each child were required to designate some practicing physician as family consultant. His name, address, and telephone number formed a part of the record. At the initial inspection, defects and indications of disease were noted on the physical record card, and notices were sent to the family consultant at the time the parents were notified. Following the inspection each defective child was recalled for a thorough examination. These examinations were not made in such cases as were taken up by the family consultant. The results of the second examination were submitted to both consultant and parents. The cases not having received attention at this time were investigated by the school nurses. If found to be indigent, permission was secured, if possible, to refer these children to a public clinic for attention. If the parents were able to pay, the nurses were required to follow up, urging upon the parents the necessity for treatment. Every child with any indication of acute illness was excluded until examined by the family physician. Every undernourished child was referred to a chest specialist, and if found to be tuberculous was excluded. Those not infected were entered in the open-air schools. There were five of these in operation.

Early in the work we realized that the best results could only be obtained through enlightened coöperation on the part of the teachers. To secure this it was necessary to give them instruction in the natural history of disease and the rationale of hygiene and therapy. We organized night classes at the municipal university in these subjects, which were attended by the teachers to a gratifying extent. When the members of these classes had shed their mystical notions under the instruction and had rationalized their attitudes toward disease, we found them enthusiastic in their desire to help us in our work in the schools. They knew beyond the possibility of doubt that there is no magical formula or patentable procedure that will surely restore health. They were convinced that hygienic living and conscientious, skilful medical and surgical treatment constitute the only protections that we have against the physical hazards of life. The best part of the experiment was that the material of our courses was transferred to the school rooms. Our students eagerly taught their newly acquired information, and we found far less difficulty in securing the interest and coöperation of the pupils and their parents. At the close of the first school year, after three periods of this instruction, we checked the attendance records of the various schools and grades and found that in the grades taught by our students the absentee rate had been reduced by 20 to 30 per cent. The properly instructed teacher is certainly the most valuable adjunct to the medical supervision of public schools.

My experience and observation lead me to believe that this work is properly a definite part of the educational system. When operated by an outside agency or another governmental unit there is an unavoidable

clash of authority. It should be done by experienced physicians, and when possible these physicians should be taken from the communities served.

I am convinced that the best results in the treatment of defects and disease among school children are secured when such work is done by the regular consultant or the specialist of choice. Public clinics have served a good purpose in relieving the indigent and in the education of the laity, but when they are operated as a public service to all and sundry they become a pernicious social influence and have the effect of seriously lowering the standards of medical and surgical practice. I have always supported most earnestly the public clinic in its function as a means of public education and in furnishing treatment for those who without its service would continue to suffer and remain unproductive. In the large cities and in teaching centers these clinics are indispensable, but in the small cities and in towns and villages the best results that I have observed have been where indigent cases were referred by charity and public health organizations to physicians and specialists in private practice, for treatment. In many such places rooms and equipment were furnished at public expense and practitioners were paid a nominal fee for each service. In my own work I employed only physicians who were debarred from other practice. They were paid generously and were well educated, good type men, but the very nature of the work seemed to have a destructive effect upon idealism and ambition.

The highest type of medical service in school supervision, as well as in public health administration and social welfare work, will never be achieved until an organized and enlightened medical profession assumes its rightful leadership and responsibility. Our interest in these important activities often manifests itself in individual avoidance of service on the boards and committees devoted to this work. In every other field of medical service men seem anxious to be honored by such appointments, but all over the country there are boards of health, welfare boards, hospital boards, and other like bodies in which the medical personnel has served year after year. How is it possible for the whole medical profession to become active and interested in medical public service unless its members are willing to serve on these boards in order that as many of them as possible may obtain useful informative experience? How can we justify the frequent and drastic criticism we indulge in when we are not willing to take these positions of trust and importance?

I have stated that I believe that medical school supervision should be administered by the school authorities as an educational activity. Wherever I have studied this service, I have found that the public health organizations had inaugurated it. This is as it should be. I also found that school authorities had resisted the invasion of their work at first and were hard to convince of its great value to the school and community. Their absorbing interest in school expansion quite naturally produced this state of mind. I also found everywhere that the local physicians were more or less suspicious of the procedure and did not give the cooperation that is requisite to success. In every community in which medical school supervision had demonstrated its value, I found a reversal of these conditions. When the school authorities became convinced that this service is of first importance to the school and community, they

entered into the spirit of the work with fine enthusiasm. Physicians were quick in seeing the great benefits and joined heartily in the effort. The public health organization gained prestige and greatly increased its epidemiological control in the community. School authorities have demonstrated their ability to handle this work effectively and are entitled to the control of all phases of their special function. Undoubtedly the greatest good to be obtained from this form of service is educational, and the public health aspect is secondary. I think it is inevitable that medical school supervision will be taken over by the school administration as one of its important and indispensable activities. I believe that medical and surgical relief for the indigent will be taken over by the welfare organizations. I believe that public health administration will revert to its function as a unit of government within its constitutional limitations. After having inaugurated many useful activities, those which are worthy to survive will be taken over by other organizations for full development. I look forward confidently to the time when the organized medical profession as a whole will realize that medical public service, properly adminstered, is to be secured only through its active interest and direction; and that medical school supervision, with its great educational value, furnishes the most important opportunity to make sure of an enlightened and healthy body of citizens for the future.

North Carolina is known throughout the nation as the most progressive state. There is no form of public service in which its achievements are not recognized as brilliantly successful and worthy of emulation. Its system of education lacks but one of the fundamentals, State-wide medical supervision in the public schools. The time has come when we can no longer delay its establishing.

SOME EXPERIENCES, OBSERVATIONS AND VIEWS OF A PRISON PHYSICIAN

L. Jack Smith, M.D., County and City Health Officer, Wilson.

The proper conduct of prisons is a subject claiming the attention of both the officials and laity of our state at this time, some holding to the belief that too much liberty is allowed and too much leniency is shown to prisoners, while others believe that barbarous and inhumane treatment is being handed out to the poor, down-trodden prisoners. An analysis of the subject will show that both are right and both are wrong. It is probably necessary that we have both extremes in order to determine the happy mean. It is not my purpose to take sides with either extreme, but rather to set forth certain facts based upon seven years' observation and experience as physician to the prisoners of Wilson County. The physician, as is well known, holds a rather unique position in relation to the proper study and understanding of human character. A thorough study and understanding of the prisoner is necessary to the proper control of his conduct.

After much thought, observation and experience, I have evolved the following principles that should govern and control a prisoner:

1. He should be provided with a safe, comfortable sleeping place. By this we do not mean that each prisoner should have a mahogany four-

poster with high priced mattress, linen sheets, and down comforts and a room with private bath; neither do we mean he should be compelled to sleep on a hard cement floor, with dirty, greasy, scant bed clothing.

2. He should be clothed with substantial clothing and shoes in keeping with weather conditions. By this we do not mean he should have patent leather shoes, silk socks, fancy spats and silk underwear, etc., but rather that he should be clothed with coarse, durable materials.

3. He should have enough substantial, nourishing food. Nourishing food does not mean that he be served with milk-fed broiled spring chicken on toast and fancy pastries; but rather with a well balanced diet consisting of meats, vegetables and starches.

4. He should be compelled to labor in accordance with his physical ability, which should be determined by the attending physician. Manual labor is conducive to happiness and good health when done in reason; "idleness is the devil's workshop" and produces morbid thought, crime, and all the attendant evils.

5. He should receive medical care, when sick, equal to that received by the average family. The physician should be called to attend a prisoner exactly as a considerate, conservative father would call a physician to attend the ills of his own family. Calling a physician to attend every little imaginary illness has a tendency to overemphasize it and will cause the prisoner to become a constant malingerer. Prisoners as a rule are good patients. They readily respond to rational treatment, but malingering must constantly be considered by the physician. Decidedly the most annoying part of a physician's duties is to decide when the patient is malingering. It is my policy to give the prisoner the benefit of the doubt, but there is great danger of destroying the morale of the camp when we excuse from work one prisoner who is deliberately malingering. Fortunately this does not occur often. Special attention must be directed to venereal diseases. We find that from 20 to 35 per cent. of all prisoners have syphilis either in the primary, secondary, or tertiary stages; most of them are in the tertiary stage. The energetic treatment of syphilis has two aspects: cure of the patient if possible, for his own benefit; and a public health value in helping to prevent the spread of this disease to others when the prisoner gains his freedom. The treatment of gonorrhea gives similar results.

You will observe that these five principles enumerated have no direct bearing upon the moral and spiritual welfare of the prisoner, but they have a decided *indirect* bearing upon his spiritual and moral conduct; and, when applied in conjunction with other specific and general measures, they will make him a better man, physically, morally, and spiritually. Now that we have enunciated these principles, the question naturally arises, how are we going to carry them out? Three factors enter into this problem, two of which are positive and the other negative. The positive factors are, first, the superintendent and guards; second, the attending physician. The negative factor includes a large number of well-meaning people who allow sentiment instead of common sense to govern their speech and acts. If I were requesetd to point out the greatest obstacles in the way of carrying out the proper treatment of prisoners, I would unhesitatingly say the first is the brutish superin-

tendent and guards who are sometimes placed in charge of prisoners—that kind of man who would abuse and browbeat his wife and children, that hard-boiled, self-conceited ass who gets drunk on a little authority and takes advantage of his position to curse and abuse a prisoner who he knows has no chance to retaliate. The English language is inadequate to express my contempt for this type of so-called man. It is this type of man who discredits and arrays the public against all the good men who are placed in authority.

Then comes the sentimentalist as the second great factor in the way of proper control of prisoners: "God be merciful to them, for they know not what they do." They hand out large gobs of sticky, maudlin sentiment, forgetting justice and the duty of the law to punish crime for the protection of society. They have a false idea and conception of the mental processes of a criminal. They try to place themselves in the position of the criminal without due consideration of the difference in the mental processes of the criminal and themselves. The sentimentalist forgets the crime committed and forgets the unfortunate victims of the criminal who suffered as a result of the crime. To illustrate this point, visit a prison with one of these hypersensitive sentimentalists and see him shrug his shoulders and then ask: "How would you like to eat that coarse food and sleep on that bunk, with all your liberties shut out by those cruel bars?" You of course as a good citizen, without the mind of a criminal, could not understand how you would react to such conditions; neither could you conceive of how your orderly, law-abiding mind would let you commit the crime that put these prisoners where they are. Of course you would not relish the food and sleep well on the bed provided for a prisoner. As a matter of fact, however, in many instances the food, the bed and even the locked cell are better than the food, the bed and room the prisoner had been accustomed to before being caught in his crime. The failure of the sentimentalist to allow his mind to deal with realities makes him an unintentional menace to society. My contempt for the maudlin sentimentalist is tempered only by my pity for his ignorance of the conditions as they are. In this connection, I should like to pay my respects to any unscrupulous prison physician who winks his eye at any wrong going on in his camp or jail and makes no effort to see that these wrongs are righted. Any physician who neglects his professional duties to prisoners who are dependent on him for protection of health and life, if there be any such physicians, is not worthy of the position he holds.

Now that we have discussed the negative side of how to carry out these principles, it becomes necessary to deal with the positive side, which is self-evident in view of the negative discussion. Therefore the factors necessary for the proper control and conduct of prisoners are: (1) A superintendent of intelligence, a born leader of men, of high moral character, sound judgment, and firmness tempered by justice (the same rule in the selection of guards applying only in a lesser degree); (2) a physician who is competent and conscientious; (3) a sympathetic, understanding public who are not afraid to make constructive criticism in the light of first-hand knowledge of any wrong that may need correction.

Hearty coöperation of all concerned, governed by justice and knowledge of conditions as they are, will solve the problem of proper control of prisons, protect society, and reduce crime.

There are a number of physically defective prisoners in our camps who are repeated violators of the law, having been given suspended sentences by the courts for the first and probably the second offense. They had the feeling that, because of their physical condition, the courts would continue to deal leniently with them by payment of costs and an admonition to "go and sin no more". But the strong arm of the law cannot deny justice longer, so they are sent out to serve a sentence at hard labor. Then come along the influential friend and relative, the lawyer and others to make pressure on the attending physician to get him to issue a certificate as to the physical disability of the prisoner, to be used along with a long list of names of petitioners, many of whom sign without any personal knowledge of the merits of the case. Then the commissioner of pardons and the governor are besieged in an effort to secure a pardon for this unfortunate victim. Many times the county officials take a hand in an effort to secure a pardon for those physically unable to labor enough to pay for their keep. These people are all well-meaning in their efforts to help the unfortunate, but they forget their duty to uphold the law and order and as a result encourage the prisoner to repeat the offense.

These physical disabilities are sometimes real and sometimes imaginary, sometimes causing complete disability and again only partial disability. To avoid all this annoying pressure on the physician, certificates of disability should never be given except at the request of the pardon commissioner and governor.

I have carefully looked over the new proposed rules and regulations governing the sanitary management of convict camps and prisons, now ready for adoption by the members of the State Board of Health, and find nothing in them unreasonable or impractical. If conscientiously obeyed by the officials, they will secure the maximum health, comfort and safety to the prisoners.

DISCUSSION

Dr. L. W. Corbett, Goldsboro: One phase of Dr. Smith's paper particularly interested me, and that was with reference to the malingerer. I should like simply to tell the story of a prisoner that I have on my hands to-day who the general public is thoroughly convinced is a malingerer and who, I am equally thoroughly convinced, is not a malingerer.

We had the misfortune in our little city of Goldsboro to have a detective imported by a local citizens' committee to right the wrongs of our community. This man was trapped in his own trap, either justly or unjustly. I don't know whether he was right or wrong; I am not entering into that; but he was convicted by a competent court of jurisdiction and sentenced to six months on the road. After he had been out on the road a short time, the highway superintendent brought him in to my office and asked me to examine him. The man had a temperature of about 99, a prostate about the size of an orange, and no evidence of any venereal disease. I passed a 30 sound in him without meeting any stricture until I came to the prostate, and from that point on I couldn't

introduce even a filiform. I reported to the superintendent that the man was not going to be worth anything to him on the road; but, because of the unpleasant notoriety we had had about him, I recommended that we try and keep it just as quiet as we could and not give him any more publicity than we could help. The next morning our paper came out with big headlines telling how this man was trying to dodge his prison sentence and had sought an examination from the health officer but not stating that it was a routine matter and that every prisoner has to be examined. About the second day after this, the guard called me out to the camp and said, "Doctor, I have a reputation for being pretty hard, but that is a sick man in there. He hasn't done anything since he has been out here. I can see he is sick just from looking at him." I stuck a themometer in his mouth and found he had a temperature of 101.

I went back and talked to the highway superintendent and the chairman of the board of county commissioners and asked them what to do. They told me to use my own judgment, but not to bring him in to the hospital if we could possibly help it. So I went out there, gave the man hexal salts for his kidney condition, and tried this, that and the other thing, but he got worse and worse. His specimen had a big cloud of pus in it. He was a man of sixty-five years of age, and the papers every day ran articles about how we were feeding a low-down, good for nothing scoundrel out there, at the expense of Wayne County, without his doing anything at all. With the knowledge and consent of the chairman of the board of commissioners I took another doctor out there with me, a specialist in genito-urinary work, Dr. Crawford—you all know him. He agreed with my diagnosis and said he didn't think there was anything to be done but to put the man in the hospital. I said, "What do you think of an operation?" He said, "You know the mortality." As I say, the man was sixty-five years old. If we kept him in the hospital, I knew the people would yell about our feeding him at the expense of the county and so forth; if we operated on him and he died they would say we had killed him. So we put him in the hospital. I didn't forget him by any means. I knew he was still there. They didn't let me forget him. About every two or three days somebody would come to me and complain about our putting him in the hospital when it cost about $5.00 a day to take care of him there.

What can I do for him? There ought to be some solution for the problem. There he is there in the hospital, at the county's expense. Fortunately, the people "laid off", because somebody high enough up told them to "lay off" at that point, or it would have been absolutely unbearable. After sixty days of hospital treatment, during which time he got over his acute symptoms, the attending physician came in and said he could not treat the fellow any longer because the folks at the hospital thought the doctor was helping him malinger. He quit; then the hospital superintendent called me up and said the prisoner was discharged and asked me to come and get him. I asked, "Is he well?", and he answered, "No, he is still in bed." "What am I going to do with him?" I asked. "How am I going to take care of him? I have no hospital here in which to take care of him." "Well", he said, "he is not a hos-

pital patient any more. He is discharged." Then the president of the board of trustees came to me and said, "Get that man out of our hospital. The chief-of-staff is coming and you will have to get him out."

We went before the governor and talked with him. I told the governor that it was a very difficult proposition; that I wasn't pleading for the man's guilt or innocence, but that we had to get rid of him somehow. We finally had him transferred to the county home. He is there now, and every time I stop for some gas one of the clerks says, "Doctor, I don't know how they can put up with that kind of stuff. There is that fellow out there just lolling around, not doing a thing in the world"—and that man is running a high temperature and hasn't been out of bed since he has been there. Is he a malingerer? What would you gentlemen do under the same circumstances?

Dr. A. C. Bulla, City and County Health Officer, Raleigh: I have enjoyed Dr. Smith's paper and agree with him on many of the important points which he has brought out. I believe that prisoners should have good treatment. By good treatment I mean good food, a sanitary place to sleep, and supervision by men who have a sense of responsibility and an understanding of what constitutes good treatment. Certainly if a county expects to profit by the working of prisoners, it must make it possible to maintain prisoners in such a state of health and cleanliness that they will be able to give in return a full day's work and to repeat it so long as they are forced to work under the law. I believe prisoners should be well cared for and should be made to work in accordance with their physical strength and the law which compels them to work. We are supposed to work and most of us do work. We have our occupations, and most people who have occupations feel it their duty to follow them. It is true there are people who have no occupation, who don't want one, and who have never had one. I believe it is largely this class of people who make up the prison population.

May I say further that I am not a physician to any prison camp, jail, or penal institution, but I know something of the class of people found in these institutions. Most of them are able-bodied men and women. They are there because they have taken chances with the law, which says to them that it is wrong to do thus and so; but they were willing to do wrong and take chances rather than do right and to be law-abiding citizens. They have been caught; they have been found guilty; they have been ordered to work and should be made to work, but under sanitary conditions and proper care and with good food supplied them.

Another point which I wish to bring out and which Dr. Smith did not mention is that, to my way of thinking, our prison system should be changed so that men when caught and waiting to be judged innocent or guilty, whether it be one month or six months, should be put to work to help support themselves during their period of confinement. I hardly think it fair to maintain in a county institution a large population of able-bodied men and women at your expense and my expense who are as well able to work as you and I, without getting something in return for their upkeep. I believe they should be put to work the day they are caught and kept at work until they prove their innocence or are found guilty. If found innocent, give them the benefit of their labors, or a

part of it. This is rather a broad statement, but I think it is not too broad to say that there are more able-bodied men and women kept at public expense in our county institutions who are well able to work than there are beds maintained in the state for indigent sick persons at public expense. There are probably twice as many. I have no way of estimating it. I believe that our county institutions should be made as nearly self-supporting as possible and at the same time serve their function of caring for and reforming criminals as far as it is possible for them to do so.

Dr. Williams: Speaking of physical fitness, does the doctor think a man sentenced to the road for six months who has chronic gonorrhea should be compelled to work? I have heard a judge say he should not.

Dr. Smith (closing the discussion): Answering Dr. Williams' question I would say yes, ordinarily, if there be no other complications that we can lay our hands on to show that he is physically unfit. We know that there are a great many men in private life working in that condition. I would unhesitatingly recommend that he be required to labor, certainly to some degree. That has been my policy. When the superintendent asks me if a man is able to work, I say, "Yes, he is able to do certain light work." If he is able to do full duty I tell him to go to it. If he is not able to work at all, I tell him to lay off. In that way, I think we treat the prisoner fairly and we treat the public fairly.

THE BREAST-FEEDING DEMONSTRATION AND THE COUNTY MEDICAL SOCIETY

Frank Howard Richardson, M.D., Black Mountain, N. C. and Brooklyn, N. Y.

The breast-feeding demonstration has come to stay. There is no question about that. It is an easy thing to put on. It commends itself very promptly to the public. They are interested in it. It commends itself to the medical profession because it cuts down infant mortality—a thing in which we are all very much interested.

What is to be the part of the medical society in the breast-feeding demonstration?

If you will permit, I will review very briefly its history. As you know, Sedgwick, in Minneapolis, a number of years ago (he has died within the last few years) worked out a technic for the breast-feeding demonstration. There are three legs to the tripod on which he erects it. The first is an interested medical nucleus; the second is the birth-recording agency or bureau of the department of health in the community concerned, whether town, city, or state; the third is a group of nurses, privately or publicly financed, who will visit these newly made mothers and inform them how breast feeding may be kept up.

As we know, it is no longer exaggeration now to say that practically every mother can nurse her baby if she is taught how, and if her doctor knows how to teach her how. We have long since realized that it is a slander against women to say they don't want to nurse their babies. Of course they do. If they are willing to carry them for nine months, they are willing to nurse them for nine months. We doctors have fallen down frequently in making it possible for them to keep their babies

on the breast. This can be done by means of the technic that Sedgwick worked out. We followed it in Long Island three years ago, and it has been followed everywhere where breast feeding has been made universal.

What is the position of the medical profession in this work? In the first place, Sedgwick had his informed group, which consisted of himself and his assistants. They were enthusiastic breast feeders. Why? They had to be, to keep their jobs. Sedgwick was enthusiastic; and they were his assistants at the college, and they had to be enthusiastic. What is the medical situation in Minneapolis to-day? A few men have learned how to make breast feeding universal in their own practices. The majority of the men have not, and breast feeding is by no means universal in Minneapolis.

What was our experience in Nassau County? The few who were concerned in the demonstration (I was there as regional consultant) learned the technic. To-day there are a few more men insisting on breast feeding for babies than there were before we started, but no very general knowledge of this technic exists there to-day.

Some time later, the little town of Hornell, N. Y., with a population of about 5,000, decided to go one better, working a step in advance of the policy that had been planned as a result of the Nassau County demonstration. They got together their town medical society (which was an academy of medicine, corresponding to the county society) and invited the State Department of Health to come in. In other words they went one step further, for the initiative was taken not by some organization outside of the medical society but by organized medicine itself. To-day their figures are better than those obtained anywhere else; because, although the men didn't all actively participate, they had as a society invited the demonstration to begin there.

There is a still further step to be taken before breast feeding is going to be permanent in any community in which a demonstration is put on. Of course, as we all know, the only function of a state department of health in putting on any sort of demonstration like this is to do something in order that it may be carried on by the people afterwards. There is a bad backset if welfare work is started and isn't carried on. The only way in which this work can be made permanent is for the county society not only to allow it, or to acquiese in it, but to take an active part in it. That is being done to-day in one or two communities in New York State, and I believe it is the only future for this whole movement. A few years ago it became possible for the State Department of Health there, through the Sheppard-Towner Fund, to put aside some money to be used as its regional consultants suggested. Some of us felt it was very important that graduate medical education should be started, but we felt that it should be started not by the State Department of Health but by organized medicine itself. A very happy marriage was arranged between the State Medical Society (which, of course, is simply the aggregate of the county societies), creating the initiative, and the State Department of Health, supplying the funds. To-day there is a widespread movement for graduate medical education all over the state of New York, financed by the State Department of Health through the Sheppard-Towner Fund but initiated and carried out by men in organized medicine. It was a perfectly logical and sensible thing that the

technic of breast feeding, which must be learned like the technic of anything else, should be taught as part of this graduate education plan. I should like to prophesy that, in every community where it is done, breast feeding is going to be not a flash in the pan but a permanent thing for the whole community.

I am going to show you a little film that we are using for county societies who wish their men to learn the technic of breast feeding. The film will show what I want to say: that there are two main points necessary in bringing about universal breast feeding. One is complete, regular emptying of the breast, whether it is by the baby or by the mother herself, by some form of expression; the other is giving the baby a complementary feeding after each breast feeding until the breast supply becomes great enough so that the baby can be fed entirely by the mother herself. Of course, those two main points are only two among a thousand important points that one learns when he is using breast feeding constantly.

Some of you are familiar with this little machine, which a lecturer can carry around. Any of you who have given public lectures know the sorrow of a speaker who has to take a big case of breakable slides around with him. He gets to his destination and gets an operator who doesn't know the slides and they begin to go in upside down and backside foremost. In this case, the lecturer is his own operator. I have here a strip of standard movie film. Instead of being a moving picture, it is a series of "stills" which can be controlled by the speaker. The lecturer doesn't have a heavy case of slides to carry around, just this little "Projectoscope"* which is but little heavier than a Corona typewriter. All the illustrative material is here in this strip, which I shall now show you.

[Note: Dr. Richardson then showed the pictures demonstrating the technic of breast feeding.]

THE VITAMIN HYPOTHESIS AND ITS SIGNIFICANCE

I. H. Manning, M.D., Dean, University of North Carolina Medical Department, Chapel Hill.

The vitamin hypothesis assumes the existence in an adequate diet of certain substances of an undetermined nature which are essential to normal nutrition. This hypothesis was first definitely formulated by Hopkins in interpreting a carefully controlled series of experiments in which he had found that the addition of 2 cc. of milk to a basal diet induced normal growth and health in young rats which, without milk, were abnormal in both respects. There are some substances in milk other than the proteins, carbohydrates, fats, and salts which are essential to normal growth and health. Hopkins wrote of them as "accessory substances"; Funk gave them the name of "vitamins". Antedating Hopkins, Eijkman had demonstrated that fowls fed exclusively on a diet of polished rice developed a fatal polyneuritis (polyneuritis gallinarum) which had its human equivalent in beri-beri, a condition which he was later able to relieve by the addition of some of the

*Made by the Spencer Lens Company, of Buffalo, N. Y.

rice polishings. Thus Eijkman was able to prove experimentally the dietary origin of a definite disease and found its remedy in an unsuspected part of a foodstuff. There is evidently something in the polishings of vital importance in a diet of rice.

Thus has come into existence a hypothesis which has revolutionized our methods of feeding and has, like Ehrlich's theory of immunity, opened a trail the end of which cannot be predicted. With it has come a reasonably exact experimental method for the study of problems of nutrition, upon which the science of nutrition must rest. Normal growth and health may be checked or altered and pathological conditions of striking and unusual variety may be produced experimentally by what appear to be insignificant and unsuspected alterations in the diet. Scurvy, the scourge of the sea, may be readily produced in guinea pigs by the omission of green foods from the diet. Beri-beri, a rare American disease but at one time as much a scourge among Japanese as scurvy among the English, has its counterpart in polyneuritis gallinarum and its remedy in a properly selected diet. Xerophthalmia or keratomalacia may be readily produced in rats by the omission of proper fats from the diet, and its human equivalent has been shown to be from the same cause. Rickets appears to have a complex etiology, but most often it is due to lack of fats. Mellanby has recently demonstrated experimentally that an improperly balanced diet for the mother results in a rachitic tendency in the offspring. Thus an assumed inherited tendency to a definite disease has been traced to an inadequate diet. The same author has reported experimental evidence to show that early dental decay, which is prevalent among English children (and the same is true of American children), is due primarily to an imperfect dental structure which has its origin in too little fat in the food. Pellagra is in all probability a dietetic deficiency disease.

In addition to these definite diseases brought about by deficiencies in the diet, obscure nutritional disorders and growth defects may result. To what extent this may find clinical application is still a matter of some speculation, but it has been established that before the onset of definite symptoms of one or the other of the diseases mentioned there are vague functional upsets of a general nature, anemia, gastro-intestinal disturbances, intestinal atony, constipation, general malaise, etc., until one may feel that the more particular disease symptoms may be secondary. Or it may be, as we so often find in children, that growth is slow and there are evidences of malnutrition for which one may find perhaps several explanations; but an examination of the diet for its vitamin content may furnish the clue to the causes of the dyscrasia.

The vitamin hypothesis offers a rational explanation of the treatment of certain diseases which until now has seemed wholly empirical. We understand that the use of fruit juices and fresh vegetables in the prevention and treatment of scurvy succeeds because such foods contain vitamin C or the antiscorbutic vitamin. This vitamin though present in a great variety of fresh foods, fruit juices, vegetables, eggs, milk, etc., is easily destroyed by heat; therefore, with the exception of tomatoes (which require a minimum amount of heat to preserve), it will not be

found in canned foods or foods that have been heated for any length of time. It is well to remember that canned tomato juice is an excellent substitute for orange juice and is more easily and economically obtained during certain seasons.

Beri-beri has practically disappeared, just as scurvy has disappeared, from the use of food containing vitamin B, or the anti-neuritic vitamin. This vitamin is found in a great variety of vegetables, milk, eggs, and other foods; and it is easily destroyed by heat. It is particularly abundant in yeast, a fact which has been exploited by one of our enterprising manufacturers to his pecuniary advantage. Vitamin B or one closely related to it may be the remedy for pellagra. At least the work of Goldberger points in this direction.

Rickets yields to codliver oil par excellence because this oil, more than any other, is richest in vitamin D, or the antirachitic vitamin. Formerly all fat-soluble vitamins were known collectively as vitamin A, but McCollum has clearly differentiated between the antirachitic and other fat-soluble vitamins, very largely on the ground of the almost specific action of codliver oil. The fat-soluble vitamins are made up of a group of at least three, if not more, viz.: the antirachitic, the growth-producing, the antixerophthalmic vitamins, and possibly others. They are unevenly distributed and apparently not necessarily contained in foods especially rich in oil or fats. Butter fat, for example, is rich in the growth-producing and antixerophthalmic vitamins, but poor in antirachitic vitamin. Vegetable oils and lard are very poor in the antirachitic vitamin. Fat-soluble A, the growth-producing vitamin, is found in milk, eggs, spinach, carrots, yellow sweet potatoes, etc. The fat-soluble vitamins are not easily destroyed by heat, and they will stand emulsification. In other words, they are perhaps the most stable of the vitamins and therefore would not be destroyed by any ordinary canning process. However, fats have the unfortunate way of becoming rancid, even when bacteria-free, so that foods to be stored are apt to acquire a disagreeable flavor. For this reason the miller and the manufacturer remove all fats as far as possible and with them the fat-soluble vitamins. Canned foods, especially artificial infant foods, are usually free of these very essential vitamins. It is very necessary, therefore, that we add fats in proper variety and quantity to artificial foods, remembering that vegetable fats are without value.

It should be emphasized that the function of vitamins in nutrition is not solely the prevention of the more or less definite diseases associated with their absence but that all are necessary constituents of an adequate diet. While adults are apparently able to withstand error for a longer time without serious consequences, the vitamins are especially important in the diet of the young. The most important in this connection are antiscorbutic and fat-soluble vitamins. Every intelligent mother has learned the necessity of giving the baby orange juice, but very few realize the importance of the fats. This is especially true when the child's diet is supplemented, as it usually is, with cereals. Mellanby has recently demonstrated some antagonism between the cereals (especially oatmeal) and the fat-soluble A group in the sense that the more cereal the more fat-soluble vitamin is required.

Chemically the vitamins have evaded the most careful search. No one has thus far succeeded in isolating and identifying any one of them. Funk's attempt to relate them to the pyrimidins and through them with the nucleoproteins was not finally succesful. There is no chemical test for them. There is a curious phenomenon in the action of ultraviolet light upon cholesterol, a substance found very generally distributed among the tissues in small amounts and very abundant in woolfat (or lanolin) and in gall-stones. This substance, on exposure to the ultraviolet light, becomes altered from a velvety crystalline structure to a dark resinous mass and acquires active antirachitic properties, properties which were entirely absent before the exposure. What chemical changes have occurred have not been worked out, but it is claimed that this is the nearest approach to the synthesis of a vitamin. Obviously it throws no light on the chemical structure of the vitamin, but it may explain the therapy of ultraviolet light in the treatment of rickets.

Physiologically the vitamins are to be classed among the hormones, with such substances as thyroxin, pituitrin, insulin, etc. At least they are analogous in two respects: First, the vitamins are extremely potent. Funk found that 4 milligrams (about 1/15 grain) of very impure preparation of vitamin B would cure a pigeon of an otherwise fatal polyneuritis. Second, they act as metabolic stimulants; in some instances as general metabolic stimulants such as thyroxin, in others as more or less specific stimulants such as pituitrin.

The trail that has now been opened by the discovery of these obscure and thus far purely hypothetical substances has led to a re-investigation of nutrition problems, and many of us may yet live to see the science of nutrition so simplfied that order will come out of the present chaos and the wayfaring man may arrange his diet with some degree of intelligence.

MEDICINE AND PUBLIC HEALTH

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Medicine was born of the desire to help those suffering from disease or injury. The appeal was personal and individual. Medicine developed not only as an individualistic art but as an art that was called into play only after damage was done. The suffering was manifest only after disease was in an advanced stage or the injury was causing pain or helplessness. Furthermore, the abundance of the diseased and injured and the scarcity of physicians made it necesary for the doctor to concentrate on those already in a far advanced stage of disease and those suffering intensely, and so medicine was built around the diagnosis and treatment of the individual with a well developed pathologic condition.

Public health, on the other hand, originated in times of great epidemics when it became necessary to pool all resources and to call in government control in order to combat and prevent the spread of a given epidemic. The next logical step was to prevent epidemics. This process was the reverse of that of medicine. This was a collective undertaking, while medicine was an individual one.

These two fields with opposite origins developed along separate lines but with one common end in view. But as medicine advanced, science unfolded, and doctors increased, the boundary of medicine was pushed back from the grossly pathologic to the early stages of the disease; and from diseases in their initial stages it pushed back to the prevention of disease. So to-day we find the profession turning its attention to the physiologic rather than the pathologic and striving to prevent disease and to keep the individual normal. It has been well said that the physiology of to-day is the medicine of tomorrow.

Likewise public health work, as science advanced and public health workers increased, burst from its shell and launched into the prevention of individual sickness as the logical step toward preventing epidemics. The next step was to treat the sick in the early stages, vaccinate, immunize, and at least diagnose and recommend treatment in many cases which years ago would have gone unrecognized and untreated until a advanced stage.

We therefore see that these fields, while beginning as two separate fields, have each advanced to a common ground. As this ground was reached, it was inevitable that along the line of contact friction would develop at various points. There are to-day points of friction. Some health officers have gone too far, and some physicians have not cooperated. But my plea is for us not to allow these minor conflicts to endanger the real program. We are all working to the same end. We are so near together that we have trouble in picking our way through this twilight zone. At times it is almost impossible to differentiate the work. It overlaps, and it is almost impossible to steer clear of one another. It is like the period of dawn when it is difficult to say where night ends and day begins. But as the light increases ultimately there comes a time when there is no doubt and we are in the full daylight of our great purpose. We find there is no conflict and that the two fields are mutually helpful.

We are proud to think that we represent the only profession which labors day and night to remove the very conditions which provide us a livelihood. But in reality we are not doing this when we practice preventive medicine. Every life saved means a potential patient many times over; often a patient more appreciative than originally and one who will consult the physician more often.

An important part of the work of both private physician and the public health officer is education of the public. This results in the public calling the doctor sooner and oftener, and in making better patients. A baby saved through proper education of the mother not only means a potential patient; but by saving those otherwise doomed to die, we save the very ones who will need more care and more treatment throughout life.

If there be a panacea, it is education—the education of the physician, the public health officer, and the public. Is there a possibility of our work becoming scarce when we consider such facts as these? About one out of every three children born in this country is born without the benefit of a physician's care. One out of every five school children has defective vision. Three out of four children need attention to teeth, and one out of twenty needs operation for tonsils or adenoids. It is not too

extravagant to say that one-half of the population to-day, if examined, would be found to be in need of some treatment. Can anything except education conquer the venereal peril, when we remember that one out of every ten deaths in adults is due to syphilis and that syphilis is responsible for the mental disease of one out of every four of the inmates in the insane asylums? Gonorrhea is the chief cause of sterility and occupies an important position as the cause of the so-called female troubles.

Public health officers must admit that from now on, unless the private physician coöperates, public health work must suffer. The health officer can handle epidemics and do vaccinating alone. But that great army of diseases called degenerative, that develop at and after middle life, present a problem for the private physician and public education. Can the problem of the feeble-minded ever be handled except through education? Only through education and a knowledge of the laws of heredity is there hope. We must watch the type of man we produce as well as the number of men we produce. After all, it is what we do in life that counts, and not how many there are of us or how long we are doing it. A study and understanding by the whole race of the laws of heredity involved in such cases as those of the Kallikak, the Jukes, and the Jonathan Edwards family would, I believe, do more good to the next generation than all the drugs in Christendom. Heredity limits the effects of good environment and good training.

I take it that epidemics and infectious diseases will all in due time be conquered, but I am not so optimistic about the cure and prevention of the individual and constitutional diseases. We can not only prolong life but we can make life fuller, more useful, and more enjoyable. It is not enough to "be up and about"; we must be in such a condition as to be anxious to meet every trial of life and accept every challenge with a bright eye and clear brain. We must be in such a condition that the experiences of life will be stimulating and pleasing. We must be able "to live more and serve better".

Though we may prolong life we can never eliminate death. Death is the penalty for our complexity and specialization. There is no individual death in the lower organisms, but "as life becomes more worth living and the organism more of an agent, the capacity for rejuvenescence becomes limited"—(J. Arthur Thompson). "For his high degree of individuation, man pays the penalty of individual death; and the conditions and processes in the human organism which lead to death in the end are conditions and processes which make man what he is." (C. M. Child.) Thus natural death is a result of specialization in structure and function.

Let us doctors, health officers, and the public gird for a forward march. First educate and then apply. In this day of speeding-up there is no time to postpone the fruits of discoveries a generation. Such advances and discoveries need not wait, as did those of Jenner and Pasteur, to be applied to future generations. There is to-day a great amount of useful knowledge which is not being used. According to Fisher, forty-two per cent. of the deaths can be prevented or postponed by the reasonable application to a reasonable extent of the knowledge possessed by well informed members of the medical profession

at the present time. With such conditions, can we afford to be idle? The education must not consist in rules and regulations but in fundamental principles. Without knowledge we must trust to our instincts; and at the present time instinct it not a safe guide to our conduct, because conditions of to-day differ so widely from the conditions of primitive times, and because instinct ignores the rights and needs of others.

The general health, in the final analysis, must depend upon the individual as the unit; and only the private doctor and education can control this unit. The private physician and the public physician are the generals in this movement. Let us not waste valuable time and talents on the minor points and the irritating conflicts of the day, for these are chiefly of the nature of growing pains. It is for us to lead the way and try to reach the condition outlined by Vincent, where every doctor is a public health officer and every public health officer a doctor.

DISCUSSION

Dr. Charles T. Nesbtt, Wilmington: After years of experience in public health work and private practice, I know that we cannot possibly proceed successfully unless the organized physicians really support public health work and participate in it actively. They have a very definite responsibility in promoting this education that is necessary for the preservation of human life and the promotion of human efficiency. More can be done in the sickroom, in individual families, and by physicians in the schools than through any other possible agency in promoting the type of education that will produce the best results. I do hope that the time will come, and soon, when every medical society of this country will be actively and closely identified with the public health activities in its own community.

SECTION ON PEDIATRICS

CHAIRMAN: JOHN LABRUCE WARD, M.D., Asheville

CHAIRMAN'S ADDRESS

THE HYPERTONIC INFANT (WITH SPECIAL REFERENCE TO THE CAUSE AND TREATMENT OF PYLORIC SPASM)

JOHN LABRUCE WARD, M.D., Asheville

Pfaundler (1), in his work published in 1908, states that congenital hypertrophic pyloric stenosis was first described by the Danish pediatrist, Hirschsprung, who reported two cases before the German Pediatric Society in 1887, the common features resembling "stenosis pylori congenita" in adults as reported by Mair and Landerer. Thanks to Dr. John Foote (2), we know that this honor belongs to Dr. George Armstrong, the English pediatrist, whose book (appearing in 1777) contained the description of a typical case, two other children of the family having succumbed to the disease. Eleven years later, according to Osler (3), the first case in this country was reported by Beardsley in the transactions of the New Haven County Medical Society. The author thus describes the autopsy findings: "The pylorus was invested with a hard, compact substance or scirrhus, which so completely obstructed the passage into the duodenum as to admit with greatest difficulty the finest probe." (Following these early reports were those of Williams in 1841 and Dawosky in 1842.) No lively interest was, however, aroused in the subject until (ten years later) Hirschsprung's paper appeared. In 1898 Cautley (4) was able to find recorded but twenty cases; whereas, four years later, fifty cases had been reported and nineteen of these had been operated upon. During the past two decades hundreds of cases have been treated medically and surgically; conclusive evidence that this serious malady is, in reality, a fairly common disease of early infancy. The monographs of Ibrahim, who in 1908 collected 400 cases from the literature, are regarded as the most comprehensive and lucid yet written. Pfaundler states that the disease seems to be somewhat peculiar to the Anglo-Saxon race, as up to 1905 no unquestioned case had been reported from Latin or Slavonic countries. In this connection, it is interesting to note that a series of cases was reported in the Revista di Pediatrica (Florence) in 1921. So far as our search of the literature goes, no case has been reported in the negro.

About 75 per cent. of the cases occur in males. The symptoms rarely occur in the first week of life, beginning in 50 per cent. of the cases by the end of the second week and seldom after the eighth week. The babe is usually the first-born, whose advent has been uneventful and who may or may not be of nervous stock. John Thomson reports one case in which the patient's father suffered from symptoms in early infancy and another in which a maternal uncle had died of the disease. Heubner mentions three fatal cases in one family. All authors agree that the condition is usually found in breast-fed babies; but this signifies nothing, since most babies are breast-fed during the first weeks of

life. As to the morbid anatomy found in pyloric stenosis, a unanimity of opinion prevails. There is elongation and cartilaginous thickening of the pylorus, the mucous membrane being swollen and invaginated into the duodenum and thus occluding the pyloric orifice. In extreme cases the pylorus is converted into a rigid canal so small as to admit the passage of only a small probe (whereas the normal pylorus during the first few weeks of life will admit a 2 F. sound). This stenosis comes from a thickening of the circular layers of muscle. Griffith (6) says: "The appearance is the same whether due to spasm or hypertrophy; and only careful study, including a slow stretching of the pylorus and microscopical examination, can show which condition is the principal cause of the stricture." Even more significant is this statement from Guthrie (7): "The degree of stenosis found after death is not evidence of its existence to a similar degree during life." Martha Wollstein (19), after studying grossly and microscopically the stomachs of 25 infants with hypertrophic pyloric stenosis, found that the stomachs were dilated and often twice the size of the normal stomach at the same age; also that the pylorus was twice the length of the normal. (The mucosa and other layers were unchanged, and there was hyperplasia of unstriped muscle cells without increase of connective tissue.)

Passing now from the pathological realm where brethren dwell together in peace and unity, we enter the realm of etiology where controversy is rife, hypotheses are numerous and proof is lacking. Is hypertrophy the result of spasm or the cause of it? Are the two associated, one or the other predominating, or are they distinct entities? The theory of congenital hypertrophy as the cause of pyloric constriction (expounded by Hirschsprung) has many adherents, among whom may be mentioned Richter (8), Griffith and Holt (9). The latter states (10) that the existence of persistent spasm of the pylorus without hypertrophy has yet to be proven. As proof they cite the early occurrence of this hypertrophy. For instance, Dent and Cautley report the condition in a seven months' fetus; and more recently a case reported by Kaiser (11) showed symptoms within 14 hours after birth and, on operation on the fifth day, "the pylorus was slightly hypertrophied and rigid and did not permit the passage of the stomach contents into the duodenum". According to this theory, the onset of symptoms a few weeks after birth finds its explanation in the assumption that this hypertrophy causes insufficient obstruction until the irritability of the stomach is added, the variable size of the palpable tumor and the cessation of vomiting (which often occurs coincident with the persistent tumor and visible gastric waves) being due to an increase of the entire gastric muscle. Hypertrophy of the pylorus has been found in persons who have recovered from or who have never shown symptoms of pylorospasm. Operative and necropsy findings demonstrate, in most cases, organic pyloric changes.

Now to consider the opposing views. Pfaundler holds that the symptoms are due solely to spasm, the apparent hypertrophy being only a spastic contraction of the normal musculature, while Heubner believes that there is a congenital gastrospasm in certain individuals. A more recent writer, Still (12), says: "That the obstruction is primarily due to spasm I regard as certain, and it seems to me most prob-

able that the hypertrophy also is the result of spasm." This opinion is shared by Thomson (13), who thus expresses himself: "A true muscular hypertrophy of this sort never occurs as a primary phenomenon but is always the result of antecedent overaction." He accounts for the hypertrophy by assuming a prolonged incoördination between stomach and pylorus and believes that the disease begins in utero, inasmuch as the normal coördinate movements between stomach and pylorus have their genesis several months before birth. Such early continued incoördination could, therefore, account for the prenatal hypertrophy in the cases recorded. If we assume the possibility of muscular incoördination in prenatal and early postnatal life (which appears to us logical), the nervous mechanism being not yet "stereotyped by usage", then the hypertrophy occurring at the pylorus rather than at the cardiac portion of the stomach is easily explained on a physiological and an anatomical basis as follows: To quote from Burton-Opitz (14): "The layer of circular strands of the stomach is the heaviest of all and is of greatest functional importance. At the pyloric and esophageal poles of the stomach it suddenly increases in thickness, forming here the so-called pyloric and cardiac sphincters. A third band of circular fibers invests the stomach at the junction between its fundic and pyloric portions—i.e., about seven to ten cm. above the pylorus. It is known as the sphincter antri pylori and corresponds to the point of origin of the peristaltic movements of the pyloric end of the organ. Anatomically, therefore, the stomach may be divided into two compartments; namely, the pyloric portion comprising about one-fifth of the entire organ, and its much larger fundic portion and cardiac recess. The antrum pylori is infinitely more active than the fundus, so much so, in fact, that the latter is commonly regarded as the reservoir of the former."

Is this not an explanation of the well established fact that the hypertrophic changes are entirely or chiefly limited to the pylorus? It is the functionally active portion of the organ—the emptying pump for the reservoir. Incoördinate movements—opposing muscular waves between the pyloric and the antral sphincters—could produce hypertrophy; and this would be more apt to occur at the pyloric sphincter, which is normally more active than the antral sphincter and which guards the small opening into the duodenum. In support of this may be cited the fact that congenital hypertrophy of the bladder and of the colon (Hirschsprung's disease) exists without mechanical obstruction to account for the pathology. Furthermore, either spasm or hypertrophy, or both, existing before birth, unless causing complete obstruction, would not produce symptoms until the increasing amount of food taken during the first few weeks after birth called forth increased functional activity on the part of the stomach. If, as some contend, the obstruction is occasioned solely by organic changes, how may we explain the fact that the infant's stomach unloads itself normally for one to four weeks and then suddenly vomiting and visible peristalsis appear? This necessarily presupposes that the growth of the tumor is disproportionate to the normal growth of the pylorus; otherwise the pyloric canal would remain relatively the same size. Such reasoning is opposed to common knowledge of body growth and, in fact, is refuted by the observation of Dr. Alfred A. Strauss, who dissected sixty-five tumors at opera-

tion and found that they were absolutely proportionate in size to the age of the infant. Pirie (15) suggests that hypo-adrenalism accounts for the spasm, and others are in accord with this opinion. (Experimentally it has been shown that the injection of the extract of adrenal glands will have the same effect as a dose of atropin; viz, it relieves spasm. Rogers says that this is due to stimulation of the sympathetic system, while others claim that it is the result of vagus depression. Spasm has been produced in dogs by the subcutaneous injection of thyroid, parathyroid and pyloric mucosa.) Haas (16), while admitting that occasionally true organic tumors are found in infants, explains the symptoms (whether due solely to spasm or to this plus hypertrophy) on the grounds of an imbalance of the vegetative nervous system—to-wit, an increased vagus activity. In proof of this, he cites the rather remarkable fact that all cases of pylorospasm (including 4 for whom operation was advised as the only means of relief) coming under his observation during a period of four years responded to atropin treatment.

When one has considered all of the arguments pro and con, he is constrained to exclaim with Omar Khayyam:

> "Myself when young did eagerly frequent
> Doctor and Saint, and heard great argument
> About it and about: but evermore
> Came out by the same door where in I went."

Those who hold that hypertrophic pyloric stenosis and pyloric spasm are distinct entities (among whom are Thomson and Richter) divide the cases into two classes depending upon the symptoms presenting. We believe that the preponderance of evidence tends to support these conclusions: (1) That most cases of pyloric obstruction showing symptoms within two months of birth are due to pyloric spasm with or without hypertrophy; (2) that the time of onset of symptoms depends, to a large extent, upon the degree of obstruction, whether organic, spasmodic or both; (3) that neither symptoms, fluoroscopic study, determination of food retention, nor passage of duodenal catheter can differentiate between stenosis due to spasm and that due to organic changes independent of or accompanying the latter.

Finkelstein (1919) reported a case exhibiting all cardinal signs of hypertrophic pyloric stenosis, including palpable tumor, but which on autopsy showed a normal pylorus. The characteristic symptoms are vomiting, constipation, wasting, scanty passage of urine or anuria, exaggerated visible gastric peristalsis, and, at times, palpable tumor. An infant, a boy in four cases out of five, often the first-born, who comes of normal or of nervous parents, and is born at full term after normal pregnancy and labor, is brought to you because of wasting. The vomiting began from the first to the fourth week after birth, rarely as late as the eighth week, has persisted and is different from that commonly seen in indigestion in that it is so sudden and forcible as to eject the food through the mouth and nostrils. This act has not been preceded by nausea, and the infant is eager for more food. The vomiting may occur shortly after food is taken or may represent several feedings, in which case it is copious, evidencing abnormal retention. The examination may reveal visible gastric peristalsis associated with palpable thickening of

the pylorus. This exaggerated peristalsis is not to be confused with that often visible through the abdominal wall of emaciated infants. Both the peristalsis and the tumor are more readily detected when the stomach is full. The peristaltic waves appear as a round swelling about the size of a small walnut, rising slowly in the left hypochondrium and rolling to the right across the abdomen, to be lost before reaching the umbilicus. Successive waves appear at intervals of ten to fifteen seconds, so that three may be visible at once. In palpating the tumor one must employ patience, tact, and warm hands. The visible peristalsis may be absent for hours at a time. The thickened pylorus is difficult of palpation when relaxed and, even when contracted, may be entirely concealed under the liver. Most authors state that the upper abdomen is distended and the lower empty, but we have seen marked visible intestinal peristalsis, and this enterospasm probably accounts for the pain and restlessness so often found. These infants fall into the hypertonic group so graphically described by Haas in these words: "The hypertonic infant is a definite clinical entity. It is characterized by hypertonicity of all the skeletal muscles, as shown by the ability to raise the head and grasp objects even in the early days of life, and by general spasticity. The hollow viscera show increased activity of their smooth muscle fibers. This expresses itself in the form of spasm involving practically every part of the digestive tube and, depending on the region, presents the symptoms of colic, visible peristalsis, vomiting, constipation, or any combination of these. Accompanying these symptoms is marked psychic irritability, expressed by insomnia, general restlessness and crying. The hypertonic infant belongs to the spasmophilic group and presents the symptoms of vagotonia." It occurs to us that this cramping or spasm of the digestive tube tends to strengthen Thomson's hypothesis as to the ill-timed (incoordinate) muscular contractions being the direct cause of spasm and the resultant hypertrophy. In substantiation the following is offered. In certain toxic conditions and in the so-called nervous diarrhea there is a marked increase in intestinal peristalsis, but this is not accompanied by pain. This speeding up of peristalsis in these conditions is due to disturbance of the nervous mechanism controlling the intestinal musculature. The absence of pain probably bespeaks a synchronous motion, that is, rapid succession of normal waves. If, then, these waves in any segment of the digestive canal are ill-timed, or there is antiperistalsis, they produce spasm; which would account not only for the pain but also for the slowing up of the onflow of the gastric and intestinal contents, both of which are common in the hypertonic infant.

If these premises are correct, then it follows that when there is a rapid emptying time of the stomach, not dependent upon ulcer but due solely to hypermotility, pain would not occur. It appears, therefore, that given a severe and persistent enterospasm (not dependent upon inflammation or ulceration) with constipation, and provided that food is passing the pylorus and there is no mechanical obstruction, we are justified in assuming the existence of peristaltic incoördination. Such incoordination is prone to appear at or shortly after birth, when the nervous mechanism is not yet "a going concern" "stereotyped by use," as is evidenced by inability of the heat-regulating mechanism to maintain a thermic equilibrium when the infant is subjected to sudden temperature

changes in his environment, by the extremely irregular respiratory movements, and by other well known phenomena which mark the young infant as a machine whose timer is out of order. In differentiating the vomiting due to pyloric obstruction from that due to other causes must be considered the following: Habitual vomiting which occurs after feeding and without other signs of indigestion and in which there is no constipation, wasting, visible peristalsis, palpable tumor, or delay in emptying time of the stomach; indigestion, which is rare in breast-fed babies and usually accompanied by nausea and anorexia; congenital intestinal obstruction, in which the vomitus may contain bile but which may successfully mimic pyloric stenosis; nervous diseases, as tumor of the brain or meningitis, with projectile vomiting; cardiospasm and esophageal stricture, in which the food is returned almost immediately without force; and gastric ulcer.

In treating these infants the physician was, until recently, between the two horns of a dilemma. The surgical treatment by means of gastroenterostomy (first performed by Stern, 1897, and first successfully performed by Lobker, 1898); forcible stretching of the pylorus or Loreta's divulsion (introduced by Nicoll of Glasgow in 1900); and pyloroplasty (first successfully done by Dent, 1902), resulted in a mortality of at least 50 per cent. The medical treatment was only a little more encouraging. It consisted in feeding breast milk by mouth or rectum, administering alkalies, and employing gastric lavage and gavage, hot fomentations over the epigastrium, water rectally and subcutaneously, and the three antispasmodics: opium, papaverin hydrochlorid (introduced by Knofelmacher and Meyerhofer), and atropin sulphate (introduced by Strumpel, 1904, the larger doses now in use having been advocated in 1910.)

Happily, both medical and surgical treatment now in use afford a very low mortality. The simple operation performed by Fredet in 1908, modified by Rammstedt in 1911 and by Strauss in 1915, has shown a remarkably low mortality. In a series of 761 cases reported by Drachster, Downes, Strauss and Borchardt, there was a mortality of only 12 per cent., that of Strauss, with the modified Fredet operation, being but 3.3 per cent. No less extraordinary has been the improvement in the medical treatment of this condition, as witness the series of 497 cases collected from the literature by Ibrahim and Sauer, which were treated by dietary measures exclusively with a mortality of 8.9 per cent. These included severe as well as mild cases treated by fourteen clinicians who had no cases operated upon. The approved treatment now includes: (1) the use of atropin as outlined by Haas; (2) the use of thick cereal feeding; (3) supplying the dehydrated infant with abundant fluids, rectally, subcutaneously, intravenously or intraperitoneally; (4) proper food; (5) daily accurate weighing. While the use of atropin was advocated by Strumpel fourteen years ago it was of little service until used as recommended by Haas, who seven years ago, under the caption, "The Atropin Treatment of Pylorospasm and Pyloric Stenosis", described the method whereby he had cured all cases treated over a period of four years. That this method marked an epoch in drug therapy, as formerly used, is attested by the failure of such treatment in the hands of skilful pediatrists. Holt in 1918 said, "The administration of drugs is not to be relied upon"; while John Thomson, three years later, wrote, "I have never

found any decided advantage from their use". Neither Still, 1918, nor Dunn, 1921, mentions drug therapy in their excellent textbooks. Haas states that the following factors are essential in attaining success with atropin: (1) An active preparation of atropin; (2) a renewal of this preparation before too great deterioration; (3) sufficient dosage. He calls attention to the fact that the inconstancy of the various preparations of atropin is not less than that of the various preparations of digitalis and to the rapid loss of pharmacological power. He proceeds as follows: A 1-1000 solution, gr. 1/4 to 3/4, of atropin is prepared. To begin with, one drop of this solution is mixed with each feeding or given in a teaspoonful of water immediately preceding each feeding if the baby is breast fed. If there is no idiosyncrasy to the drug, the dose at the next feeding is two drops; and this dose is continued during the next twelve hours unless there is no improvement, when a larger dose may immediately be used. At the end of twenty-four hours one may be using three or four drops with each feeding. If, after twelve hours more, this has not proven effectual and there is no flushing of the face or other symptom of physiological saturation, then the dose is to be increased by one drop at each feeding until the symptoms are satisfactorily controlled. He has used six drops at each feeding, 1/24 of a grain in twenty-four hours, in an infant two weeks old. The drug must be continued from a few weeks to several months, and the time at which it may safely be discontinued is determined by decreasing the quantity from time to time. The toxic reaction to the drug consists of flushing of the face or of the entire body, dilated pupils with no reaction to light, rise of temperature from one-half to two degrees, dryness of lips and mouth, with inability to secrete tears, anuria, irritability and quick jumpy movements, pallor, and drowsiness. Fortunately, none of these symptoms is dangerous, and they disappear within a few hours after the drug is discontinued. Hypertonic infants tolerate larger doses than do normal infants. A common dose for one of these infants, from a few weeks to a few months of age, is 1/50 to 1/25 grain in twenty-four hours, with an extreme of 1/16 grain.

Sauer (17), in his classical monograph appearing two years ago, reports excellent results with thick cereal feeding. (He modestly gives Birk, 1914, credit for first recommending this measure, but its general use is largely due to its advocacy by Sauer.) In his first article, appearing eight years ago, he reported splendid results in eleven of twelve cases (despite the fact that the peristaltic waves and the tumor, where palpable, persisted for weeks or months after cessation of vomiting). This formula consisted of eight per cent farina, four per cent of dextrimaltose, 38 per cent of milk and 50 per cent of water. This, after being boiled in a double boiler until sufficiently thick to adhere to an inverted spoon, was fed by the use of two tongue blades, one to introduce the food well into the mouth and the other to scrape it off; at least two tablespoonsful being given 6 or 7 times daily. Nursing infants were given a portion of the formula before each breast feeding, or breast milk (instead of cow's milk) was used in its preparation.

Porter (18), in an unusually interesting retrospect of his fifteen years experience with hypertonic pyloric obstruction, says, "The last ten patients that I have seen have been treated dietetically with uniform success with a modification of the Sauer formula. The formula employed was ten

per cent rice flour in diluted milk, low in fat, to which sugar was added. For the paste made with rice he claims these advantages over that made with farina: It is less apt to cause diarrhea, more readily soluble when being reheated, and has better colloidal action. He suggests this ingenious method of feeding the paste: the use of a Hygeia nipple, the end of which has been slit with a very sharp knife.

According to Finkelstein, the value of thick foods in allaying spasm is due chiefly to their consistency, while Porter holds that their virtue is derived from their colloidal quality. Cannon has shown, experimentally, that food with a high carhohydrate content passes more rapidly through the pylorus than does other food. At any rate, the thick paste meets all of these requirements. Those who contend that the pyloric obstruction is due solely or chiefly to organic changes have not yet explained why a thick tenacious paste will pass through a narrow canal more readily than will fluids such as milk or water.

In a small series of eight cases of pyloric obstruction treated within three years we can attest to the great value of atropin as used by Haas and also to the value of thick cereal feeding, although the latter when used alone did not relieve the symptoms to any great extent. Two of these infants were fed on breast milk only, while five cases were given thick cereal alone or supplementary to breast feeding. The thick cereal was invariably tolerated better than the breast milk.

One infant (now under treatment) while taking 1/100 grain of atropin six or seven times daily vomited breast milk, developed diarrhea on farina paste, and for three months has been thriving on lactic acid and goat's milk after failing to show much improvement on lactic acid and cow's milk. Only one of these cases was treated in a hospital or had a trained nurse in attendance. It was necessary to continue atropin for from five to nine months. When the dose was reduced restlessness and pain recurred before vomiting, and these symptoms were immediately relieved by increasing the dose. Seven of the cases when one year of age were normal in every respect. The atropin seemed to act better when given ten minutes before feeding. In one case, the pain was so severe as to necessitate the use of morphia hypodermically on two occasions. Gastric lavage and gavage were used in a few instances in two cases, and no fluids were introduced except by mouth. In our experience, a combination of atropin in full doses with thick cereal feeding and an abundance of fluids has proven the best method of treating these troublesome cases.

In conclusion, we would stress these points: (1) Pyloric obstruction is a rather common and very serious disease of unknown etiology, which manifests itself in the first few weeks of life. (2) The most striking symptoms are persistent explosive vomiting, wasting, constipation and oliguria. There often occur exaggerated visible gastric and intestinal peristalsis, colic, marked restlessness, irritability and crying. (3) All such infants should immediately be given large doses of a freshly prepared solution of atropin and kept on it until symptoms fail to recur, when the dose is reduced. (4) If breast fed, the milk should be expressed and given in definite quantities every three or four hours, or the infant accurately weighed before and after each feeding to determine the quantity which he gets. If the vomiting continues unchecked, use thick

cereal feeding made with diluted breast milk. When the latter is not obtainable, diluted goat's milk or cow's milk may be used. (5) Equally as important as food is the administration of water by mouth or the use of dextrose, normal salt or Ringer's solution, rectally, intraperitoneally, subcutaneously or intravenously. These dehydrated infants need four ounces of fluid per pound of body weight every twenty-four hours, and it must be remembered that thick cereal has a very low fluid content. In extreme cases, blood (unmodified or citrated)—given intramuscularly or intraperitoneally—is clearly indicated. (6) It is essential to know whether the weight curve is rising, stationary or falling; and there is but one way to determine this—viz., daily weighing on accurate beam scales graduated in 1/4 ounces. (7) This is a self-limited disease which, in most cases, can be cured by medical and dietetic measures if the physician will persevere.

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DIABETES IN INFANCY AND CHILDHOOD

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Because of certain fundamental differences between infant and child life and adult life, diabetes mellitus in infancy and childhood becomes a different problem from diabetes in adult life. Nutrition and growth must be maintained in the infant and child, and the foods must be of a character adapted to their digestive capacity. This, together with their greater susceptibility to the acute infectious diseases as well as to other infections, makes the problem of the diabetic child a more serious one than that of the diabetic adult.

Definition. It is my purpose in this paper to point out these difficulties and discuss their possible solution. Diabetes is a disease in which the secretion of the islands of Langerhans is deficient; and, as a result, the normal utilization of carbohydrates is impaired and glucose is excreted in the urine.

Etiology. Joslin reports 5.4 per cent. of his cases as occurring in the first decade of life. Obesity is considered one of the predisposing causes of diabetes, but in the first decade of life it plays little part. The Jewish race shows a special predisposition to the disease. It has not been clearly demonstrated that heredity has any appreciable influence. Repeated infections and the rapid occurrence of the acute infectious diseases, which cause local interference with the normal action of pancreas and liver, are etiological factors of importance.

Symptoms. The symptoms of diabetes mellitus in infancy and childhood are quite striking and characteristic. The most prominent symptoms are irritability, general indisposition, and increased thirst, with polyuria. Fever is rare; tenderness is sometimes present over the pancreas. Albumin when present is a serious factor. Acetone and diacetic acid are very frequently found in infantile diabetes. The specific gravity of the urine varies from 1.008 to 1.050. The quantity of sugar varies from 1 to 6 per cent. The blood shows increased sugar content over normal.

Diagnosis. The diagnosis of diabetes cannot be made simply by the presence of glycosuria. In anhydremia glucose is present in the urine, due to the fact that blood-sugar has risen above the normal threshhold or because of some impairment in the function of the kidney permitting glucose to be excreted regardless of concentration in the blood. In renal diabetes there is a constant excretion of sugar in the urine independent of diet or blood-sugar concentration. In chronic nephritis associated with general capillary damage and elevated blood pressure glucose is constantly found in the urine. In cachexia, where there is general body damage and kidney leakage, glucose may appear constantly in the urine. The diagnosis may be made with certainty by the glucose-tolerance test. This is carried out by the administration of 1.75 grams glucose per kilo of body weight in 200 c.c. water on a fasting stomach and observation of the effect on the blood-sugar concentration. The mildest diabetic shows a much decreased tolerance. However, Joslin says: "I always use such a test with reluctance," and "Diabetes can be diagnosed in the vast majority of cases without the use of the glucose tolerance test." It may

be quite accurately diagnosed by the symptoms mentioned above, viz: irritability, increased thirst, polyguria, loss of weight, glycosuria, and increased blood-sugar persisting over a considerable period of time.

Treatment. The treatment of diabetes in infancy and childhood is twofold: (1) dietetic, (2) medical. The dietetic treatment must be of such a nature that it will permit nutrition and growth and at the same time tax as little as possible the carbohydrate tolerance of the patient. The medical treatment, insulin, must be such that it will aid the natural tolerance and partially restore the lost tolerance. The diet must then fulfill the caloric requirement, the protein requirement and the optimum carbohydrate requirement. The caloric requirement for the diabetic child is approximately the same as for the normal, and it must be distributed in such a way that it will not produce ketosis or acidosis. The protein is derived chiefly from milk, eggs, and meat; the carbohydrate is derived largely from fruits and vegetables of the 5 and 10 per cent. class.

In preparing the diabetic diet for an infant, milk is the basis of the diet, but a quart of milk contains about 40 grams of lactose. If this is removed the protein and fat remaining may be utilized. This may be done by precipitating the casein with chymogen and straining off the whey, which contains most of the lactose. The curds left from preparing one quart of milk in this way contains twenty-five grams protein, twenty-five grams fat and five grams carbohydrate and may be used in the diabetic diet. The diet, then, for a diabetic infant would consist of one pint of whole milk, chymogen milk, fruit juices, green vegetables, bread from diabetic flour, butter, eggs, etc.

Medical Treatment. The medical treatment consists entirely of insulin given in sufficient amount to maintain normal blood sugar and to prevent glycosuria. This may be done by giving one unit of insulin for each two grams of sugar excreted. The number of the injections depends upon the severity of the diabetes. In mild diabetics one single injection given one-half hour before breakfast may be sufficient; but in the more severe cases this is not sufficient, and two, three or even four injections may be necessary in the twenty-four hours. If the amount necessary exceeds 20 units it is best to give three injections daily, given one before each of the three meals. If, however, the case is very severe and approaches the total diabetic stage, the effect of the evening injection will be gone before the time for the first morning injection, and in such a case an injection during the night will be found necessary. These injections are kept up until the urine has been free from sugar for two or three weeks, when the amount may be gradually reduced.

In cases where there is a strict adherence to the diet and the insulin is given in sufficient amount to keep the blood sugar normal or approximately normal, many cases will gain in tolerance; and some cases may even go without insulin. In general, the more acute the disease and the earlier insulin treatment is begun, the more favorable will be the outcome in the establishment of tolerance. Infections such as colds, tonsillitis, etc., are very serious complications in these cases and very quickly and seriously impair the glucose tolerance, necessitating more strict dietary measures and return to much increased doses of insulin.

The insulin requirement in infants is likely to vary considerably, due to poor appetite, vomiting, diarrhea, and variations in metabolism caused

by infections and increased activity. In such cases it is of value to examine each individual specimen of urine voided. Fortunately, the mother may be readily taught to make urine examinations and administer insulin in the home; and these patients may be quite readily treated in the home, much to the gratification of both mother and patient.

Report of Case. A case illustrating the points brought out in this paper was the following:

Frances M., a Jewish infant, age 21 months, was brought to my attention because of her irritability, loss of weight, frequent urination, ingestion of large quantities of water, and general illness. The physical examination showed a poorly nourished and developed female infant, no organic lesions of heart or lungs, no splenic enlargement, and nothing noteworthy except the evident state of malnutrition, tonsillar infection and cervical adenopathy. The urine examination showed sugar in large quantities. The patient was admitted to the hospital October 21, 1925, weight 22-5/16 lbs. The blood sugar was .164 mg. per 100 c.c. blood. The urine was negative for sugar at this time. This followed a twenty-four-hour period of starvation.

Feeling that the blood-sugar was too near normal to make a positive diagnosis of diabetes, a glucose tolerance test was given October 23, with the following result: First specimen, taken one-half hour after the glucose, showed .333 mg. sugar per 100 c.c. blood. The second specimen, taken one hour after the glucose, showed .363 mg. sugar per 100 c.c. blood. The third specimen, taken two hours after the glucose, showed .320 mg. sugar per 100 c.c. blood. The urine showed 1.9 per cent sugar one-half hour after the test, 2.1 per cent one hour after the test, and 2.08 per cent. two hours after the test. This proved quite definitely the presence of diabetes mellitus. The following four or five days showed a variation in the urine-sugar from 1.5 to 5 per cent. The total quantity of urine voided was very small, but this was rather uncertain due to the difficulty encountered in obtaining the total twenty-four-hour specimen. On October 31 the patient went home, against advice. During this stay in the hospital the effort was made to obtain results with dietetic treatment alone. The results were unsatisfactory.

The patient was not seen again until November 18, at which time she was very drowsy and seemed to be rapidly approaching a precomatose stage. She was admitted to the hospital November 19, and during this stay in the hospital the coöperation of the parents was good. Upon admission to the hospital the patient was put upon a diet as follows: Vegetable broth made from spinach, carrots and string beans, one pint of whole boiled milk daily, the yolk of one hard-boiled egg daily, 8 ounces meat broth daily, one teaspoonful of codliver oil three times daily. The diet represented approximately 600 calories, which is insufficient for growth and development in this patient. Only 160 c.c. urine was obtained in the first twenty-four-hour specimen. This contained 1.25 per cent sugar. Seven and one-half units of insulin was given one-half hour before breakfast; five units one-half hour before supper. The diet was increased by adding a slice of bacon, creamed cauliflower, creamed celery, 8 ounces more of boiled milk, (making a total of twenty-four ounces, and one slice of Lister's diabetic bread with butter twice daily. This brought the diet to a point where the patient was receiving approximately forty calories

per pound of body weight. The urine continued to show sugar, varying from 1.25 to 6 per cent. During this period the weight had gone down, getting as low as twenty-one lbs. The patient, however, seemed improved; the mentality became better; and the kidneys were acting more freely. Vomiting occurred at times.

November 22: General condition was improved; food was taken well; and the patient seemed happy. Urine showed 1.25 per cent. sugar. November 26: Insulin was increased to five units three times daily, given one-half hour before meals. November 28: General condition was markedly improved; took all the food well; was happy and playful. Kidneys acting more freely. No sugar present in urine. December 1 to December 16: No sugar was present in urine; condition seemed good except for occasional vomiting. December 19: Insulin was omitted at 1:30.

Shortly following this the patient had an acute upper respiratory infection, and on December 22, 3.43 per cent glucose was present in the urine. During the period from November 26 to December 22 the weight fluctuated between 20-11/16 and 22-7/16, with a slight gradual increase. December 23 five units of insulin was again given at 1:30 p.m., making three doses daily; a total of fifteen units.

Following the upper respiratory infection it was quite difficult to keep the urine sugar-free, but on December 30, it again became sugar-free and remained so with but slight exception until the discharge on January 28, 1926. The weight at this time had increased to 23 pounds.

SUMMARY

(1) On account of the fact that nutrition and growth must be maintained in the diabetic infant and child, it becomes a more serious problem than diabetes in the adult.

(2) With the use of insulin a sufficient diet may be given to promote growth and in large measure the patient may be made happy and kept sugar-free.

(3) Infections, to which this class of patients are especially prone are very serious complications. When they do occur sugar almost immediately appears in the urine and is quite difficult to eliminate.

(4) Insulin must be given in sufficient quantities to keep the urine sugar-free if we hope to attain any measure of success in our treatment of these patients.

DISCUSSION

Dr. Samuel F. Ravenel, Greensboro: Dr. Brooks has given a lucid and concise presentation of a subject which to me is a very difficult one. To my mind the change in the prognosis of diabetes in children and infants in the last few years, since the advent of insulin, is one of the most striking things which we have ever seen. I think as recently as 1922 one of the foremost authorities declared that diabetes in children was hopeless and that all treament was useless. I think that many children are now being treated successfully all over the world. In a report by Joslin, he states that in a large series of diabetic children over 40 per cent have been able to reduce the dose of insulin over a period of years. All reports show that there has been a distinct change for the better. So far as symptoms are concerned, in the very few

cases which I have had (I have only had two of them) enuresis was a marked symptom—enuresis coming on late, associated of course with other symptoms of diabetes. I think while many adults may do without insulin, nevertheless with the child it will be necessary to give nearly every one insulin. At least it will help most of them, because of the severity and rapidity of progress of the disease in children. There is one point about giving carbohydrate to these children. I think it is very wise to distribute the carbohydrate equally—divide it into an equal number of parts and at each meal have the same amount of carbohydrate. In regard to a diet for these children, I think a safe diet to begin on is one gram of protein, one gram of carbohydrate, and two grams of fat per pound of body weight. We should use that as a beginning diet until the glucose tolerance is discovered. This is rather lower than many physicians advocate and is especially low in fat. But children are prone to acidosis; they are prone to vomiting on a high fat diet; and I believe the fat diet advocated by Drs. Newberry and Marsh would not work as well in children as in adults. I think in using insulin one has to be more careful, perhaps, with children than with adults. Some children are prone to develop insulin reactions or rather to not show signs of insulin shock until the blood sugar has reached a dangerously low level. I saw one child on two occasions who showed mild insulin shock, and the blood sugar was 25 mg. per 100 c.c. Dr. Stearns, of Iowa, has recently reported a case that showed the same thing.

Dr. C. A. Street, Winston-Salem: I think the average doctor is entirely too afraid of using enough insulin and enough carbohydrates. I don't have any trouble with the patients that I treat in regard to their breaking the diet. They have no reason to, because they get enough to eat of what they want without desiring to break the diet. Not only that, but they feel normal. There are no restrictions on their diet that would keep them from eating in a restaurant or a hotel. They can eat anywhere they want to, and by using a little common sense they get along finely. I do not have any of my patients on a weighed diet now, because I think the trouble of weighing the diet is unnecessary after they are acquainted with food values. They can take five or six units of insulin a day, and they feel that much better and get rid of the idea that they are patients. I have one patient, an orphan boy, who was in an orphan home and had been kicked out of the place because he was supposed to be a thief. That ought to have been a pretty hard proposition to handle. He never has given the slightest trouble. I got him to weigh his diet at first, because I wanted him to get the idea of how careful he ought to be. I see him only about once in six months now, although he writes me once in a while. He doesn't eat many potatoes but practically what he wants of green vegetables. I let most of my patients eat a dessert of whatever they want. Peach pie or icecream and cake are all right. But if they eat dessert, they leave off potatoes and bread.

The idea of a high fat diet with insulin is not right. Some time ago Dr. Sansum had an article in the *Journal of the A. M. A.* in which he gave as an illustration a man who was on a diet of 2500 calories. He was a mild diabetic. He hadn't lost weight, but he didn't feel good. He was a business man with a lot of work to do, and he wasn't satis-

fied with the way he was getting along. He came back, Dr. Sansum gave him 250 grams of carbohydrates, and he went about his work. I know in most of the cases of diabetes that I see I have to practically eliminate the fat. I don't have a fat-free diet, but I leave off butter and most bacon and fat meat. They have cream if they want it. But, in the long run, the insulin is going to be determined by the number of calories they take. I don't care if they take sugar unless they go to excess. Most of my diabetics eat candy occasionally. But the insulin you give is determined by the calories and not by the fat. Those fat diets are abominable. I wouldn't put a dog on one. If you fed a convict on one he wouldn't go to work. They don't like it. If you take the same number of calories and give them in a carbohydrate they get along just as well. Otherwise they feel they are on restrictions, and they break over. If you give them 100 or 150 grams carbohydrate they feel better and have no inclination to break diet, because they get all they want; and all you have to do is to make them take more insulin. It is hard to keep the urine free from sugar all the time; frequently there is plenty of sugar in the urine in the morning. Under the old method of starvation, the lowest blood-sugar was in the morning before breakfast; when they take insulin the highest is in the morning before breakfast. It is just the reverse. Blood-sugar does not amount to so much, anyhow, because every once in a while if a patient takes too much insulin he will have a low blood-sugar and will know it. I think the doctors ought to give more insulin and more carbohydrates. Patients don't feel good unless they do have more, and we might just as well let them live normal lives. That is my idea. In treating my patients I don't want them to feel that they are sick. They have no right to feel that way, because if they have the proper treatment they are not going to be sick. They can feel good and go about their work.

Dr. A. S. Root, Raleigh: I think that is a very slipshod way to treat diabetes. When you disregard the diet and think only of insulin you are doing the patient an injustice. The treatment should be a dietetic treatment supplemented by the use of insulin. You can't hope to bring the children to a state of vigor if you are going to disregard the proper diet.

Dr. T. M. Watson, Wilmington: I should like to mention a case of a remarkable parent taking care of a diabetic. The case was just an ordinary severe diabetic coma. The child came to the hospital, and his condition cleared up very nicely. I shall not take your time to describe the course. The father was an old countryman, and we thought the case was hopeless under his care and looked for the boy to come back in a week or two in coma again. But this old man worked out the boy's food from the diet list and made him stick to it and kept sending me specimens of the urine. He was faster at figuring out the diet than I was. Ever since then, when Johnson wants a new list he writes to me, and I tell him so many grams of carbohydrates and so many of protein and so many of fat; and on the next day's mail he sends me the diet list made out—just as perfect a list as any doctor could make out. The boy is getting along finely. It has been about ten months now since he first came to me. If he gets a little upper respiratory infection, the old man runs the insulin up to maybe twenty units three

times a day; then when the infection subsides, he slips the dose down again and gets along on two to three units three times a day. He is a boy about nine years old. When he came in he had a very severe acidosis. We gave him 300 cc. of 20 per cent. glucose intravenously, with enough insulin to take care of that and the extra sugar present, which I think corrects the ketosis a good deal quicker than giving the insulin straight in the diet. As soon as he was out of the coma we put him on a full diet of 1950 calories and enough insulin to take care of it. As far as we could see, he was a total diabetic at the time; and it took about ninety units of insulin a day to keep his urine sugar-free and to keep his blood-sugar down within the range of normal. He had an upper respiratory infection. When that cleared up we reduced the amount of insulin, and in about three weeks' time he was taking a full 2000 calorie diet. Now he is taking three units of insulin before two meals a day, and part of the time he gets along without any at all. Getting back to my subject, this old man can figure diets better than I can, and better than a lot of other doctors with whom I have come in contact.

Dr. M. Y. Keith, Department of Pediatrics, Washington University School of Medicine, St. Louis, Mo.: What Dr. Root has said is absolutely true in the treatment of diabetes. This should be treated in a scientific way. The number of units of insulin given should be governed by the number of calories in the food the patient takes a day. High caloric feedings can be given very satisfactorily if the necessary insulin to take care of them is also given. By giving a high caloric diet you are aiding the patient to build up resistance to overcome infection, to which this type of patient is most often quite susceptible; and by giving high caloric feedings the patient is greatly benefited. Frequent blood-sugars should be taken and the insulin proportioned to the percentage of sugar in the blood. In regulating the doses of insulin, it is necessary to bear in mind that about 50 per cent of the protein of the diet will be converted into sugar; about 10 per cent. of the fats will be concerted into sugar and, of course, all the carbohydrates. Basing your insulin on the assumption that one unit of insulin will burn two grams of sugar, the total units of insulin given should be based on this principle.

Dr. Street: I agree that my methods sound slipshod. I have figured thousands of diets and weighed them up and have worked on that thing a long time. I know that most doctors are too hard on patients. They don't get the results they would get if they were more liberal with the patients and gave them a high carbohydrate diet. You have to have the patient know what he is eating. If you can get him to know the value of everything he eats, he can tell pretty well what is in a piece of bread or a potato or beans or spinach or whatever he is eating. In that way he can go along after he has had some training. Of course we have to teach him to figure the diet at first. He will not learn food values if we can not make him do that. We have to make him figure diets. There are a lot of patients who were under the old system and came from the old to the new, and they soon get rid of their scales and go about just like anybody else. They get along first rate, too. They

only thing is to have them keep the fats low, because they do take on fat. They have to be on a reducing diet all the time, and you have to watch what they eat or they will get fat.

Dr. Brooks (closing the discussion): If we follow the doctor's statement to the logical conclusion, we would say that it matters not how much pain a patient has, just increase the morphin and let him have his pain. Give him a little more and let him go ahead. The object of insulin in treating diabetes is not only to increase the carbohydrate tolerance but to establish the lost tolerance. I don't see how we can hope to do this by feeding a patient cake and icecream.

CONGENITAL URINARY OBSTRUCTION

W. M. Coppridge, M.D., Durham.

Congenital urinary obstructions are now recognized to be more common than was formerly believed. The importance of a knowledge of the various forms of these conditions and the symptoms they produce is becoming more apparent. This is especially true as regards the pediatrician and general practitioner, since most of these lesions are of such a serious nature as to result fatally before the patient passes through childhood. Early diagnosis will often result in a cure, and for this reason a broader understanding may lead to the recognition during life of conditions that were formerly found only at autopsy.

Modern urology is recognizing the importance of urinary obstructions in general. Past generations have thought more in terms of kidney lesions. Urologists to-day are possibly just as interested in the drainage apparatus, namely, the ureters, bladder and urethra. There appears to be no doubt that a great amount of kidney pathology which was formerly supposed to be primarily renal in nature is due to lesions of the lower urinary tract.

Congenital obstructions may occur in the ureter, bladder or urethra. Strictures of the ureter have been observed in the new-born. Cases of congenital narrowing of the ureteral meatus with hydroureter and hydronephrosis above have been reported. The most common site of congenital obstruction is in the posterior urethra in males and at the bladder neck in females. In the male, stricture may occur in any portion of the urethra as well as at the meatus. In the posterior urethra the obstruction usually is caused by valves or folds of mucous membrane. Hinmann and Kutzmann have recently published a thorough review of this subject. They report six cases and collect fifty others from the literature. Young reports twelve cases operated on with good results. Young classified the valvular obstructions into three types, depending upon the attachment of the valves and the type of obstruction produced. The exact embryological explanation of the formation of the valves is not clear, but most of them are attached to the verumontanum and are supposed to be concerned with some error of development of this structure. Other forms of obstruction, congenital in nature, have been described. Young reports a case of fibromuscular obstruction at the neck of the bladder. The pathology in this type seems to be an overgrowth of fibrous and muscular tissue with a certain degree of spasticity, which tends to obstruct. The case I have to report, I believe, falls in this class.

The results of any of the above types will depend upon the amount of retention produced and whether or not infection is present. If the retention is great, regurgitation up the ureter occurs; and finally hydroureter and hydronephrosis result. If infection be present, pyelonephritis may occur. The kidney function is very seriously affected, and the end result is usually complete renal destruction.

The symptoms of such conditions vary greatly, depending upon the degree of obstruction and whether or not infection is present. By a study of the cases reported it is found that the symptoms may be very few. There is usually the history of some urinary disturbance from birth. Enuresis is common. Frequent difficult urination, with pain, may be the chief complaint. A full bladder can often be demonstrated. Pyuria of varying grades occurs. In the more advanced cases, where the back pressure has begun to cause kidney destruction, the picture becomes that of renal insufficiency, edema, vomiting, anemia, or high blood pressure. Death usually comes with uremia.

The diagnosis usually can not be made from the symptoms and physical findings alone. Persistent pyuria, associated with slight urinary symptoms with a constantly full or partially filled bladder, should always make one suspicious of urinary obstruction. A careful physical examination may, in the more advanced cases, show, in addition to the full bladder, the presence of enlarged kidneys. The finding of residual urine is suggestive in cases in which no enlargement of the bladder can be demonstrated. Once the condition is suspected it can be definitely diagnosed by cystoscopy and urography. In very young infants it is now possible to carry on complete urological studies with the cystoscope and ureteral catheter. Simply filling the bladder with 10 per cent. sodium iodid solution will usually show regurgitation up the ureters, especially if the case is at all advanced.

Most congenital obstructions are amenable to treatment. The obstruction may be attacked suprapubically through the bladder or through the urethra. Fulguration or excision of the obstructing valves through the urethroscope have been done repeatedly with satisfactory results.

The most important phase of the subject is that of early diagnosis. The result of the treatment depends almost entirely upon the amount of kidney damage. The early incidence in life and the insidious nature, producing as it does such serious damage, emphasize the importance of early recognition.

Case Report: Through the courtesy of Dr. B.U. Brooks, I am permitted to report the following case:

Master F. M., age 10 years, was admitted to Watts Hospital January 2, 1922, with nausea and vomiting as the chief complaint. The present illness began about two years previously with an attack of what was diagnosed "kidney trouble," the details of which could not be ascertained. At that time there was some vomiting and weakness, and the patient has not been strong since. He was able to attend school irregularly but at times would have attacks of vomiting and swelling of the face and extremities. He has become progressively weaker. The family history showed the father living and well; the mother died two years previously of tuberculosis; otherwise the family history was negative. The patient had had measles, whooping-cough, chickenpox, and influ-

enza in 1918. He had not been seriously ill with any of these diseases. He had been a bed-wetter up until a year before admission but had never complained of any urinary disturbance, no pain, frequency or bleeding.

Physical examination showed a well grown, fairly well nourished boy of 10. He was pale, and there was some suggestion of edema of the face but none of the extremities. He had a nephritic appearance. The tongue was heavily coated, teeth good and tonsils not enlarged. The heart was normal, but the breath sounds were harsh and a few rales heard over the bases posteriorly. At the entrance examination the abdomen was negative for masses or tenderness. The temperature was normal; pulse 100; blood pressure 135/100. The urine showed a heavy cloud of albumin, acid reaction, Sp. Gr. 1.001, few pus cells, no casts, no red cells, and few epithelial cells. The blood showed 7,800 leukocytes and 2,900,000 red cells with Hb. 58 per cent. Over a two-hour period only a trace of phthalein was eliminated. Several tests showed readings of from 1 to 5 per cent. for two hours.

Of course a diagnosis was made of chronic renal insufficiency. In view of the family history of tuberculosis and the chest findings a study for pulmonary tuberculosis was made. The sputum was several times negative; the x-ray report was probable tuberculosis of the right base, but subsequent examinations threw doubt as to there being any active involvement. The feces were negative for ova and parasites. The child was given the usual treatment for chronic nephritis. After several weeks of apparent improvement the edema returned and vomiting occurred. The urinary picture remained about the same, from a trace to a cloud of albumin, few pus cells and never any casts. The phthalein excretion was never more than a trace. The blood-urea ran from 90/100 mg. per 100 cc. There was never any complaint or symptom referable to the bladder or kidneys.

Dr. Brooks asked me to see the case after the child had been in the hospital about two months. I concurred in the diagnosis of chronic nephritis, and we saw the case together several days. It was noticed that the bladder was distended at times but not extremely so. At other times it was not discernible. There appeared to be little indication for urological study, and the general condition of the patient was not such that it seemed desirable to administer an anesthetic unless cystoscopy was definitely indicated. The child became progressively weaker; vomiting increased; the blood pressure arose to 180/110; the edema became marked; convulsions occurred; and the child died on May 5th, four months after admission. The bladder was markedly distended during the last days, and we were unable to pass even a very small catheter or probe into the bladder.

Autopsy revealed a greatly enlarged and hypertrophied bladder, marked hydro-ureter, and bilateral hydronephrosis, with complete renal destruction. There was no evidence of valves in the urethra nor any stricture. The neck of the bladder was greatly hypertrophied, forming a fibromuscular ring which produced obstruction. Microscopical sections from this area showed the ring to be composed chiefly of muscle mixed with fibrous tissue. The opening through this ring would admit only the smallest filiform.

In this case the whole picture, until the last week of life, was that of chronic nephritis. Our mistake in diagnosis was due, I believe, to the absence of infection and our inability to constantly demonstrate a distended bladder. There were never more than a few pus cells in the urine, and the case was entirely afebrile after admission.

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DISCUSSION

Dr. S. R. Thompson, Charlotte: I am associated with Dr. McKay, who was to have discussed this paper but is unable to be here, so I should be glad to say a word.

This paper brings to the attention of pediatrician and general practitioner the advantage of a complete examination. The symptom-complex and the results produced by obstruction in the vesical neck in children are practically the same as in the adult. With obstruction and back pressure on the kidneys you have chronic nephritis as a result, so nicely demonstrated by the case presented by Dr. Coppridge. By means of the modern urological instruments it is possible to examine children as you do the adult, and we would urge a complete urological examination in cases of chronic pyuria or symptoms of obstruction. Treatment in cases of this type is the same as it is in the adult, or even the aged—the removal of the obstruction.

I should like to call especial attention to the amount of information gained by an autopsy. I think autopsies should be obtained more often, especially with the view of making a complete and final diagnosis.

Dr. B. U. Brooks, Durham: I want to thank Dr. Coppridge for the paper and also for the help and coöperation he gave me in looking after this case. I also suggest to the pediatrician who is not closely aligned with some urological man he should become so, because they certainly do help us to arrive at definite conclusions about our cases. Dr. Coppridge, not only in this case but in every other case of a urological type, has been of very great help to me in all my work.

ROSEOLA INFANTUM—THE ROSE-RASH OF INFANTS

S. F. Ravenel, M.D., Greensboro.

Seven typical cases of this disease have been seen in my private practice in North Carolina within a period of eight months. The unfamiliarity of many physicians with the syndrome has promoted this report.

This eruptive fever, first accurately described and named by Zahorsky[1] in 1910, has been since reported from many sections of the United States,[4 14 15 16] from Canada[5], Europe[6 7], and the Orient.[8 17]

Zahorsky[1] described the disease under the name of "roseola infantum", and this term is commonly employed. Veeder and Hemplemann[4] prefer "exanthem subitum" as being more descriptive. Westcott[9] described these cases as "pseudorubella" and recently Heiman[10] has used the term "the critical pre-eruptive fever". Zahorsky[3] has seen over three hundred cases in fifteen years, and Heiman[10] compares its incidence not unfavorably with measles and above that of rubella.

The disease occurs without relation to geographical location, climate, social condition, or sex. The etiology is unknown. No connection between this and any other disease has ever been established. It is almost exclusively a disease of young children. The majority of cases occur between the ages of five months and three and one-half years, though cases have been reported in children as young as two weeks[1], and as old as fourteen years. More cases are reported during the late spring and summer[11] than at any other times, but no season is exempt. Practically all of the reported cases have been in artificially fed infants, and Zahorsky[3] says that the exclusively breast fed baby seems to be immune. So far as I have been able to ascertain, cases have been reported only in the white and Chinese races. I have observed one case in a mulatto. The complete absence of contagion is one of the diagnostic features. Indeed Heiman says: "No case has ever been seen ..... which could be related to another known case". However, Griffith and Mitchell[11] observed two typical cases in one family, the second occurring five days after the first.

The incubation period is, of course, unknown because of the absence of contagion. An authentic second attack was encountered only once by Zahorsky[1] in his large series. One attack apparently confers permanent immunity.

The onset is always abrupt, with fever which reaches 102° to 105° within a few hours; and this is frequently the only symptom until the rash appears. Occasionally there will be vomiting at the onset and very rarely convulsions. The appearance of well-being and lack of prostration exhibited by these patients is in striking contrast to the height of the fever. Rarely, a loss of appetite or transient looseness of the stools is observed or, more frequently, a mild irritability or restlessness. The temperature usually continues elevated until the fourth day, when it falls by crisis. Exceptionally the fall occurs on the third or fifth day. Defervescense is followed by the appearance of the rash. One observer[10] reports a morning remission in the fever, but this has not been noted by others. It is characteristic that the patient feels perfectly well during the eruptive stage. Catarrhal symptoms are usually absent, but there is often a reddened pharynx and occasionally injected ear drums and conjunctivae. Marked enlargement of the postauricular and cervical lymph nodes is stressed by Heiman. The other writers have not found this a prominent feature.

The eruption, which appears usually on the fourth day, after the temperature has fallen to normal, is seen first on the neck and spreads rapidly over the trunk and thighs. The face and postauricular regions are generally heavily involved, the distal portions of the extremities only slightly so. The lesions are pale, rose-red macules or papules one to five mm. in diameter, irregular in outline, usually discrete but becoming

confluent at the height of the eruption, and resembling markedly those of measles or rubella. A crescentic grouping is never present. The rash does not fade on pressure. The eruption reaches its height in a few hours and disappears within from twelve to twenty-four hours without itching or desquamation.

As pointed out by Veeder and Hemplemann, there is a leukopenia with a relative lymphocytosis during both the febrile and the eruptive stages. The white blood cells may be as low as 3500 and the lymphocytes rise to 80 or 90 per cent. The examination of the urine reveals nothing abnormal. Blood cultures and Widal reactions have been negative in the few cases in which they were done.

After defervescence and the fading of the rash, the patient is cured. No complications or sequelae have ever been reported.

Probably the most common mistake in diagnosis is to regard these cases as rubella. The differential points are: (1) The absence of contagion in roseola; (2) the presence of more marked catarrhal symptoms in rubella; (3) the fever in rubella is much lower and there is no critical fall; (4) the eruption of rubella occurs at the height of the fever and not after complete defervescence; (5) the leukopenia, which is invariable in roseola, occurs only occasionally in rubella. The differential diagnosis from scarlet fever, measles, and erythema infectiosum should cause no difficulty. Variola and dengue fever, both of which have sudden and unexpected rashes, are characterized by severe prodromal symptoms.

I do not believe that anyone who has carefully observed this eruptive fever doubts its existence as a distinct clinical entity. Heiman[10] says, "It can truly be said of this disease that its frequency varies with the doctor's knowledge of the syndrome."

The following seven cases of roseola infantum were seen in private practice in this state within the past eight months.

1. G. C. An artificially fed white male of ten months had a sudden rise in temperature to 104° with some irritability and restlessness but did not seem sick. When seen on the second day his temperature was 103.8°. He showed only a moderately reddened throat and ear drums and marked enlargement of the postauricular and postcervical nodes. There were no Koplik spots. The urine was negative. The W. B. C. was 5400, with 72 per cent lymphocytes. The fever was maintained above 103° until the evening of the third day, when it fell by crisis. In a few hours the typical eruption of roseola appeared on the neck and chest and spread rapidly to the trunks, legs, postauricular region and face. The rash disappeared completely within eighteen hours without desquamation. Recovery was uneventful.

2. B. H. An artificially fed white male of seven months had had a suddenly beginning high fever for three days with a mild rhinitis and slight irritability. The appetite was good; the stools were normal; and the child slept well. On the fourth morning the temperature was normal, but a rash had appeared. When seen a few hours later the patient presented a macular rose-red eruption on trunk, face, neck, and legs. The pharynx was red and postauricular glands were enlarged. The child seemed to be perfectly well and happy. The physician with whom I saw this patient made a diagnosis of rubella. When the distinctive

features were pointed out he readily recognized the difference and admitted that he had probably incorrectly diagnosed as rubella many cases of roseola. The eruption disappeared in twenty-four hours without desquamation.

3. A white female of three years had had a high fever for four days after an abrupt onset with vomiting. She had pulled at her ears and had taken her feedings poorly but was lively and played with her toys as usual. When seen on the fourth day with a temperature of 104° she showed a very red throat, violently inflamed ear drums and large postauricular nodes. The urine was negative. On the fifth morning the fever fell by crisis and an eruption appeared. In the afternoon she presented a morbilliform maculopapular rose-red eruption on face, neck, body, legs and arms. The rash did not fade on pressure and was confluent on back, chest, and abdomen. The temperature was normal. Within twenty-four hours the rash had faded completely. There was no desquamation. The family physician made a diagnosis of rubella.

4. A two-year-old artificially fed mulatto boy was seen on the second day of a febrile illness which began abruptly and was characterized by high fever and anorexia. He had slept well and did not seem sick. The temperature was 104.5°, and his pharynx and ear drums were moderately inflamed. The postauricular and cervical nodes were enlarged. There were no Koplik spots. Roseola was suspected and a blood count done. The white blood count was 4900 with 75 per cent lymphocytes. The mother was warned that a rash would probably appear on the third or fourth day, and a good prognosis was given. The fever fell by crisis during the third night, and the next morning a typical roseola eruption was seen. The eruption faded rapidly, and there was no desquamation.

5, 6, and 7. The other three cases present such exactly similar onset, symptoms, fever with crisis and eruption that it scarcely seems necessary to report them in detail. A blood count done in one of these cases showed 4100 white cells with 65 per cent. lymphocytes. In one of these patients a typical case of rubella was observed three months later during the course of a small epidemic.

It seems probable that this eruptive fever is far more common than is generally supposed. I am convinced that many sporadic cases of rubella reported in the absence of an epidemic are really examples of roseola infantum. This necessarily entails useless quarantine. Heiman[10] is of the opinion that the disease can be diagnosed often before the eruption has appeared. I feel that by keeping this disease in mind we may strongly suspect the true diagnosis and give an excellent prognosis as early as the second day in appropriate cases with typical symptoms.

CONCLUSIONS

(1) The eruptive fever known as roseola infantum is a not uncommon clinical entity in this state; (2) roseola infantum occurs in the negro race as well as in other races; (3) the diagnosis may at least be suspected before the appearance of the eruption and a good prognosis given.

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DISCUSSION

Dr. A. S. Root, Raleigh: The most satisfying thing in the practice of medicine is to know what is wrong with our patients. All of us have seen cases of roseola infantum, but we did not recognize them until Zahorsky in 1910 first called attention to it. Since an acutely inflamed throat is associated with the disease, we made a diagnosis of tonsillitis and called the rash a "toxic rash". This term "toxic rash" falls into the same class as growing pains, biliousness, and uric acid rash, all of which should be eliminated from our medical nomenclature. In speaking of skin conditions a pediatrician must be a dermatologist. I do not know of anything that makes friends or enemies more quickly than the proper or improper diagnosis of skin diseases. Let me suggest that if you have not been to the Vanderbilt Skin Clinic it is well to visit it every time you go to New York City, because there you find the finest collection of skin diseases in any place in the world. After this clear discussion of roseola infantum presented by Dr. Ravenel, I am sure that more of these cases will be recognized by us hereafter.

ETIOLOGY AND PROPHYLACTIC AND SERUM TREATMENT OF SCARLET FEVER

J. Buren Sidbury, M.D., Wilmington.

Scarlet fever is one of the serious diseases of childhood and ranks fifth in mortality in children from 4 to 9 years[1]. Seventy-four per cent of all deaths from scarlet fever occur under ten years of age. It is not so much scarlet fever *per se* that we dread but rather the complications. Drs. Blake and Trask[2], of New Haven, have divided scarlet fever into three definite phases: (1) Uncomplicated scarlet fever; (2) scarlet fever with septic complications; (3) scarlatinal sepsis.

(1) Uncomplicated scarlet fever is a specific toxemia caused by a superficial infection of the nasopharnygeal mucous membrane with streptococcus scarlatinae, without definite invasion of the body tissues by the organism. As in diphtheria, a soluble toxin is produced locally, which is absorbed into the system and gives rise to constitutional reactions and the rash. (2) Scarlet fever with septic complications consists of the

specific toxemia with the invasion, local or general, by the streptococcus scarlatinae or other pyogenic organism. (3) In postscarlatinal sepis the toxemia has terminated but the infection of the tissues remains, producing systemic symptoms. The symptoms produced by the specific toxemias are fever, rapid pulse, prostration, delirium, nausea, strawberry-tongue, and the rash; the phenomena caused by bacterial invasion are represented by purulent rhinopharyngitis, sinusitis, otitis media, mastoiditis, adenitis, meningitis, arthritis, and septicemia.

The duration of the specific toxic phase, which is usually the duration of the rash, varies from four to seven days but may be longer in severe cases. During this time the specific scarlet toxin is circulating in the blood, as has been shown by Trask and Blake[3]. By the end of the first week, local or general septic processes are the most prominent symptoms in the cases sick at this time. By this time the specific toxemia has disappeared, as shown by the disappearance of the rash and appearance of antitoxin in the circulating blood, even though the patient may be very sick and septic. All patients who have septic processes after the rash has disappeared should be considered in the stage of postscarlatinal sepsis. We must think of scarlet fever as a combined toxic and bacterial infection, in which immunity to the disease is of an antitoxic character and not an antibacterial character.

Etiology. The hemolytic streptococcus has, for a long time, been recognized as an ever present organism in the nasopharyngeal mucous membrane of patients with scarlet fever. Through the work of Tunnicliff[5], Bliss[6], Dochez[7], Gordon[8], and the Dicks[9], this organism has finally been identified as the etiological agent. Krumwiede[10] reported a case of scarlet fever in one of his laboratory workers, following the accidental swallowing of a culture of the hemolytic streptococcus. The Dicks[4] experimentally produced scarlet fever in man in 1923 by implanting the hemolytic streptococcus, which had been isolated from the infected finger of a nurse who was taking care of a case of scarlet fever, on the nasopharyngeal mucous membrane of several volunteers. The Dicks[11] obtained a toxic filtrate by growing the streptococcus hemolyticus on blood agar. This gave a positive reaction in those who had not had scarlet fever and a negative reaction in those who had had the disease. This toxin is neutralized by serum of convalescent patients.

Prophylactic. The Dick test is very much like the Schick test: 0.1 cc. of diluted toxin of known strength is injected intradermally on the right forearm for the test; a similar amount of heated toxin on the left forearm for a control. The positive reaction in the Dick test begins to appear in four to six hours and may disappear in twenty-four hours, but is usually at its maximum in twenty-four hours. There is a local area of redness, varying in size from that of a dime to a twenty-five-cent piece. It varies from a faint pink to a deep red. There may or may not be local induration. At twenty-four hours the Dick test compares with the Schick test at four days. The local action of the scarlet fever toxin is primarily on the capillaries, and this explains the rapidity of its appearance and disappearance.

Positive reactors to the Dick test are susceptible to scarlet fever in that they have not a sufficient antitoxin in their blood. It does not

mean that all susceptible cases will develop scarlet if exposed. The local mucous membranes in healthy persons have a certain amount of resistance to infection which temporarily protects the individual. This may be broken down by trauma or disease. A striking illustration of this is cited by Zingher[1] and is interesting enough to quote here. "One of the physicians at the Willard Parker Hospital was on duty in the scarlet fever pavilion for three months without contracting scarlet fever. When assigned to duty in the diphtheria pavilion, he developed diphtheria and two days later scarlet fever. The diphtheria process evidently destroyed the local resistance to infection by the hemolytic streptococci, which were evidently present for some time but could not exert their pathogenic action on the normal mucous membrane." Negative reactors show no change in the skin at the site of infection. They have antitoxin in their blood which neutralizes the toxin injected.

The Dick test is positive in scarlet fever patients up to four to seven days, when antitoxin is developed as a result of the infection. Of 141 cases tested during the first five days of the disease at the Willard Parker Hospital, 100 per cent. showed a positive Dick test. Of the 170 cases tested on admission, 158, or 93 per cent, gave a positive reaction earlier in the disease and gave a negative reaction during convalscence (Zingher[1]).

Two patients were admitted to the Willard Parker Hospital with a diagnosis of scarlet of 12 and 13 days' duration. They gave a strongly positive Dick test. Five days later they developed scarlet fever. Ten days after the onset of the scarlet developed in the hospital, the Dick test was negative. A strongly positive Dick test in a case of so-called scarlet fever, four to five days after the onset of the rash, should make one doubt the diagnosis. On the other hand, a definite negative Dick reaction, during the first few days of the suspected eruption, should make one doubt the diagnosis of scarlet fever. The Dick test reaction becomes negative from five to ten days after the onset of the illness[1].

In 1918 Schultz and Charlton[12] demonstrated the rash extension test, which bears their name (Schultz-Charlton reaction), by injecting a small amount of convalescent serum in the skin of a scarlet-fever patient. In six to twelve hours there developed a blanching of the reddened skin, which persisted until the rash faded. This is produced by the antitoxin neutralizing the toxin in the area injected. This blanched area does not desquamate if this is given within twenty-four hours after the appearance of the rash. The area of blanching at the site of injection varies from two to six cm.

Zingher[1] has shown that there is a close similarity in the reactions to the Schick and Dick test: (1) Mothers transmit their immunity to their infants if they have any, and mothers who give a positive Dick test have infants who also show a positive Dick test; (2) The age susceptibility is much the same as in diphtheria. (3) Social group. The higher the social stratum the higher the susceptibility, and *vice versa.* (4) Families may have a high degree of susceptibility, or *vice versa.*

Active Immunization with Scarlet Toxin. This is given at weekly intervals from three to five doses and is given subcutaneously. There is usually little or no reaction; occasionally a systemic reaction, with fever, vomiting, and flushing of the skin. We had one such case when a

child had a very strong Dick reaction. His first dose, of 500 units, gave no reaction; the second dose, of 3,000 (which was thought to be his third), gave fever, nausea, and a rash, but all symptoms disappeared in twenty-four hours. Those who have strong Dick reactions should receive smaller doses than normal.

Dosage. The New York City Board of Health advises three doses—250, 500, 1000. Dick advises five doses of 500, 1500, 20,000. Zingher treated some 1400 positive reactors, and 65 per cent. gave a negative retest at the end of four weeks. This immunity develops in three or four weeks, where diphtheria immunity takes three or four months.

My tests shows:

		Positive	Negative	Per cent positive
Children treated	73	58	15	79.4
Nurses treated	44	6	38	13.6
Number retested	274	107	167	61.0

Prophylactic Antitoxin Serum. This is not recommended because most of the serums now used are very apt to produce serum sickness, which is often alarming to the parents. Too, the susceptibility to scarlet is not so great as to measles or some of the other contagious diseases, and many who are exposed do not take it. The antitoxin is very effective when given early. With but one or two exceptions, practically all the cases to whom we gave the serum developed serum sickness, and one of them looked as if he would die of a condition simulating angioneurotic edema. Adrenalin was given in these cases; and they all came around, after much anxiety on the part of both parents and doctor. This immunity lasts a very short time, just as is true in other antitoxins.

Case 1. Family of three children—13, 7, and 4 years. The oldest child had had scarlet fever six years before. The 7-year-old boy developed scarlet fever and was given antitoxin, and his four-year-old sister was given a prophylactic dose. The boy made an uneventful recovery, with the exception of a serum sickness on the fifth day. Two days after he was released from quarantine, or 32 days after her inoculation, the younger child came down with scarlet fever and was given a therapeutic dose. She ran a stormy course for two and a half weeks but recovered. She also developed serum sickness on the fifth day.

Case 2. A. M., 7 years, developed scarlet fever and was given antitoxin. Clinically well in two days. On the fifth day, serum sickness. His younger sister, with whom he slept the night before, showed a positive Dick. She was given a prophylactic dose, and two weeks later the toxin immunization was started. She got four doses. Did not develop scarlet.

TREATMENT

Treatment. Scarlet fever antitoxin, when given early, will promptly cure an uncomplicated scarlet fever. This is evidenced by the critical fall of the temperature and pulse to normal and a rapid fading of the rash with disappearance of symptoms of toxemia. Quoting from Blake and Trask[2]: "During the period covered by this report, 57 cases of uncomplicated scarlet fever, 48 cases of scarlet fever with septic complications, and 7 cases of postscarlatinal sepsis have been treated with Dochez's unconcentrated antitoxin by intramuscu-

lar injection. The 57 uncomplicated cases were all promptly cured within twelve to thirty-six hours, irrespective of the severity of the disease at the time of treatment. All but five remained well; of these, two subsequently developed a mild nonsuppurative cervical adenitis late in convalescence, one an otitis media, one a transient fibrinous pleurisy, and one an acute nephritis. All recovered satisfactorily. Of the 48 complicated cases, all but one were promptly and permanently cured of the specific toxemic phase of scarlet fever, as shown by fall of temperature, rapid fading of the rash and prompt neutralization of toxin in the blood. Their septic complications, however, were not immediately cured but subsided more or less rapidly, depending upon the nature, duration, and severity of the complication. In one extremely severe case with ulcerative tonsillitis, cervical adenitis, thrombophlebitis and septicemia, a single injection of 40 c.c. of antitoxin failed to cure promptly the toxemia or to benefit the complication, and the patient died on the eighth day. Only three of this group subsequently developed additional complications—otitis media in three, otitis and mastoid in one, nonsuppurative cervical adenitis and arthritis in one. In the seven cases of postscarlatinal sepsis, no demonstrable benefit resulted from the administration of antitoxin.

Size Dosage, advised by Blake and Trask[2].

	Mild or moderately severe	*Severe*	*Extremely severe*
Children	30 to 40 cc.	40 to 60 cc.	80 cc.
Adults	40 cc.	60 to 80 cc.	80 to 120 cc.

As in diphtheria, there should be one dose sufficiently large to keep the blood antitoxic long enough to cure the disease, and this should be given as early as possible. If the temperature rises again after the drop, a second dose should be given. Intravenous injection gives the best results and should be given to all severely toxic cases.

Here I wish to report two cases from Willard Parker Hospital[13] which demonstrate the effect of the serum treatment.

Case 1. G. C., age 7. Sick two days with headache and vomiting. Rash developed on morning of 23d. Admitted on afternoon of 23d with temperature 103, a pulse of 150, a marked rash, and an inflamed throat. Dick test made on admission was positive. Severity was graded as moderate to severe. Received intramuscularly 40 cc. (about 3,000 units) of Dochez antiscarlatinal serum. On 24th rash greatly lessened. Dick test made on morning was negative. Temperature in morning 101; P.M. 100. On 25th rash disappeared. Temperature 99. Uneventful recovery.

Case 2. A. K., age 32. Developed sore throat on the 17th, rash on the 19th, and was admitted early in the afternoon on the 20th. Temperature on admission 102; soon rose to 104; pulse 130. Throat was inflamed; adenitis was present; and the patient was fairly toxic. Received 2,400 units of antitoxin serum intravenously on admission. Within two hours felt improvement. At the end of six hours temperature had dropped to 99°; rash had faded; and the patient felt almost well. Convalescence was uneventful.

Complications. Antitoxin seems to have little effect on the cure of complications but does seem to have some effect on their prevention when given early.

Conclusions. (1) The Dick test is a reliable index of immunity and susceptibility to scarlet fever. (2) The Dick test and the Schultz-Charlton reaction are definite aids in diagnosis of doubtful cases of scarlet fever. (3) Scarlet fever is a combined toxic and bacterial infection caused by the hemolytic streptococcus. (4) The immunity from scarlet fever is from a toxic origin and not bacterial. (5) The results with the Dick test in normal healthy persons resemble closely the results with the Schick test. (6) Active imunization with scarlet fever toxin is a safe procedure and confers immunity in some 60 to 50 per cent. of cases by the end of four weeks. (7) Scarlatinal antitoxin in proper doses is a specific and prompt cure for uncomplicated scarlet fever. (8) It indirectly benefits septic complications during the acute stage of scarlet fever by curing the septic toxemia. (9) It is not of value in postscarlatinal sepsis after the rash has faded. (10) "The amount of antitoxin required to cure scarlet fever promptly and with certainty by intramuscular injection varies from 3,000 units to 12,000 units (30 to 120 cc. of a serum which neutralizes 10,000 skin-test doses of toxin per cc.)" (11) The best therapeutic results are obtained by giving one large dose early, as soon as diagnosis is made.

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DISCUSSION

Dr. A. S. Root, Raleigh: We are prone to look upon scarlet fever in this latitude as a mild disease, and it is perfectly true that the farther south we go the less malignant is the disease. But every case of scarlet fever has in it potentialities of danger.

We have in our hands now a curative means, due to the splendid work of the Dicks and Dochez, of which too few of us are taking advantage. Scarlet fever antitoxin should be given, in my opinion, in every case of scarlet fever as soon as it is diagnosed. The other children of the family who have been exposed to it should be Dick tested, and if the test proves positive they should receive immunizing doses of the serum.

It is more or less impracticable to Dick test children in the public schools because of the high cost of the Dick material. After performing their brilliant work the Dicks have commercialized their product so

that the cost makes its general use almost prohibitive. This is very unfortunate and so different from Best, Banting and their coworkers, who gave insulin to the world for the relief of hundreds of thousands of people.

Even though scarlet fever is, as we see it, a mild disease in this climate, we never know when a case is going to be severe; and the milder cases are just as apt to be followed by nephritis as are the severe cases. I was called in consultation about a month ago to see three children who were desperately sick with scarlet fever. One child was fourteen months old and had a membranous angina and had to be intubated. She survived this operation but died a day or two later of toxemia. The life of this child could have been saved and the convalesence of the other children immensely shortened if they had had scarlet fever serum at the onset.

Dr. J. G. Martin, Lumberton: Is it not a little difficult for us to determine the value of the antitoxin, compared with the antitoxin of other infectious diseases, because of the inability to trace the origin of scarlet fever? In my ten years' practice I believe I have had only about ten cases of scarlet fever, and I can't recall a single case where I was able to trace the origin. So I wonder if it isn't a little difficult to emphasize the value of the antitoxin in preventing scarlet fever. I don't believe there are any of the infectious diseases that are more severe than scarlet fever or more treacherous. I have seen the mildest cases develop mastoiditis when from the symptoms you wouldn't think there would be any trouble at all with the case. I feel that if we can prevent scarlet fever it is one of the greatest discoveries that has ever been made.

Dr. Samuel F. Ravenel, Greensboro: I want to say a few words to emphasize the great value of antitoxin in severe cases. I happened to be on pediatric work at Yale when they did their work with serum. I had the misfortune of having five consecutive cases of scarlet fever that died. It was a terribly severe form of the disease, and it gave me a horrible idea of it. The serum came in. The next case that came to the hospital was just as severe; the temperature was 106, the child was practically unconscious, with a pulse almost gone, and it was felt that the patient would surely die. Drs. Blake and Trask gave a large injection of the antitoxin, and in twenty-four hours the temperature was normal and the patient recovered. I think the value of the antitoxin is tremendous, and I urge that it be given in any case in which the temperature rises above 101°. I think that this is the criterion used by the Dicks. I think the antitoxin is just as valuable as diphtheria antitoxin.

Dr. Sidbury (closing the discussion): Probably all of you men are familiar with this product (passing around the materials of the Dick test and scarlet fever antitoxin). We have had much less reaction with the Squibb's product than we have with the Dochez's serum. I much prefer to use Dochez's, if it had this other quality with it. Squibb's product is very much better, in that it is less apt to give serum sickness. It is perfectly clear, as contrasted to the other product.

In regard to Dr. Martin's question, this man that I spoke of was a doctor who worked in the scarlet fever ward. He did not develop scar-

let fever while on duty in the scarlet fever service, but when he went into the diphtheria ward his resistance was lowered and he had both scarlet fever and diphtheria.

The different doses in this test are 500, 1,500, 5,000, 15,000, and 20,000, given at weekly intervals. I think the difficulty is that it is hard to get mothers to come back three, four, and five times to get their babies stuck so many times. They have been educated in diphtheria work to three doses and they think that is enough. When you ask them to come back five times, it isn't always easy to get them to do it. But the mere fact that these children have been retested and have shown negative Dick tests in 70 per cent. of the cases, in four or five weeks, certainly emphasizes the importance of immunization.

CERTAIN PHASES OF UPPER RESPIRATORY INFECTIONS IN CHILDHOOD

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Infection plays a very important part in the practice of pediatrics. This is true in cases in which the nutrition of the child is involved. Many infections are severe enough to be easily detected and measures instituted to check them. Others are of such a mild nature that they are often disregarded or minimized. Such infections, whether mild or severe, cause systemic reactions of varying degree. The temperature is, as a rule, taken as the index of the severity of the condition.

Many such infections are due to or result from an inflammatory reaction of the upper respiratory tract. Many observers have reported various systemic conditions to be due to infections of the paranasal sinuses and mastoid cells[1-9]. Cholera infantum, nephritis (parenchymatous and hemorrhagic) carditis, chorea, multiple arthritis, pyelitis, cyclic vomiting, asthma, eczema, anorexia, and anemia, have all been found to be due to or associated with infection of the upper respiratory tract. These foci of infection are not always easily found. Often the local manifestation is rather hard to find, requiring repeated careful examinations by competent otolaryngologists. Sometimes these conditions are found only when the sinuses are explored, and in some cases the focus has been found only at necropsy.

At the Children's Hospital, Iowa City, cases have been observed that confirm many of the findings of these observers.

Case Reports. (1) H. B., age 11 years; admitted to the hospital with a complaint of kidney trouble. Onset three weeks before, which was noticed as a swelling of the eyes and ankles. The family physician found a large amount of albumin in the urine and placed him on a milk diet. One week later he began vomiting and complained of headache. Next day the patient became blind. This condition was followed immediately by convulsions, which lasted for five hours. Examination revealed slight edema over the shins. Blood pressure 100/68. Urine showed much albumin, pus cells, red blood cells, and casts. W. B. C. 13,700; N. P. N. 53-63 mg. P. S. P. 36 per cent. McClure test 20 minutes. Otolaryngological report: Sinuses negative, exam. and x-ray; chronic tonsillitis; adenoids. Tonsils and adenoids were removed. Patient had an uneventful recovery and returned home in good condition.

(2) L. McQ.; age 9 years; admitted to the hospital with complaint of Bright's disease and enuresis. One year ago had stayed in the Mayo Clinic for seventy-eight days, with acute hemorrhagic nephritis. Tonsils and adenoids were removed. Albumin had been persistently found in the urine since then. For past three months there has been enuresis. Examination was negative except for enlargement of the cervical lymph nodes. Urine showed albumin present in large quantities and an occasional cast. N. P. N. 50.8. There was mild fever present. Otolaryngological report: Chronic ethmoiditis. Adenoids were removed. Sinus drained well; condition cleared up quickly; and the patient returned home in excellent condition.

(3) E. K., age 8 years. Entrance complaint of kidney trouble, which was first noticed two weeks before as a swelling of the face, hands and feet. The condition grew worse. On examination she was found to be pale, pasty, and anemic. There was marked generalized edema. No free fluid in the abdominal cavity. Urine showed a marked quantity of albumin to be present, a few pus cells, a few casts, no r. b. c. N. P. N. 53.6 mg. P. S. P. 60 per cent. Otolaryngological report: x-ray of sinuses showed blurring of antra; tonsils infected. Tonsils and adenoids were removed and the antra rasped. Much thick pus was obtained, which grew staphylococci on culture. The patient's condition gradually grew better, and she returned home in very excellent condition.

This patient has been back to the hospital twice for a check-up on her condition, and at neither time were we able to find any evidence of former trouble.

(4) R. L., age 2 years. Entrance complaint was of swelling of entire body. Onset three weeks before, beginning as swelling of the hands and feet. This condition gradually grew worse until the abdomen became filled with fluid, necessitating a withdrawal of part of the fluid. Examination showed a pale, anemic, pasty, listless child. General anasarca, with leakage from the paracentesis wound. Urine examination revealed a large amount of albumin, pus cells, and granular casts. No red blood cells present. N. P. N. 29.3 mg. McClure test, three minutes. Otolaryngological report: Chronic tonsillitis, adenoids, and chronic pansinusitis. Tonsils and adenoids were removed and maxillary sinuses drained, thick pus being obtained which grew staphylococci on culture. The patient developed a streptococcic septicemia and died.

In these cases we have two types of nephritis, the first two being fairly typical of hemorrhagic nephritis and persistent albuminuria, following a typical attack of hemorrhagic nephritis. This condition shows a rather typical and constant picture—albuminuria with hematuria and edema, which is not a marked sign of the disease. There is, usually, a retention of nitrogenous waste products and an elevation of blood pressure. The causative organism is, as a rule, the streptococcus. The treatment from a dietary standpoint is a diet low in protein and salt. The other phase of the treatment is operative, to remove the focus of infection.

The last two cases are representative of parenchymatous nephritis. This condition is also known to have a very definite picture, which is also fairly constant—albuminuria, without hematuria. Edema in this form of nepritis is a very striking sign. There is usually no retention of nitrogenous waste material in the blood. The blood pressure is not altered and the kidney function not impaired. The dietary treatment differs markedly from that of the other form. In this type there is a high protein diet given, made up chiefly of eggs and meats[8]. The operative treatment is to eradicate the focus. This focus is usually found

in the maxillary sinuses, and the causative organism is the staphylococcus. These patients are very prone to develop a superimposed infection, caused by the streptococcus, and in such instances the prognosis is very bad.

In 1925-26 Floyd[1], Marriott[2], Jeans[3], and Jeans and Floyd[4] have reported cases of cholera infantum, which were due to or closely associated with acute infections of the upper respiratory tract. In these cases the pathology was found in the mastoid antrum and the paranasal sinuses. The infection in many of these cases was very hard to find, requiring repeated examinations by the otolaryngologist. Even when the focus is found, the infection is often so slight, when compared to the systemic symptoms, that it is difficult to believe that it is the causative agent. As Floyd[1] has pointed out, the local pathology is often masked by the severity of the gastro-intestinal symptoms.

Case Reports: (1) C. L., age 23 days, was admitted to the hospital for feeding care. Slight fever present on admission. Six days later developed a marked diarrhea with high fever and rapid loss of weight. Otolaryngologist's report was that not enough pathology was present to cause such a severe reaction. Large quantities of fluid were administered, but weight loss was just as rapid, and the diarrhea seemingly became worse. Patient continued to grow worse during the day, toxic, ashen in appearance. The next day the otolaryngologist reported a bulging of the posterior superior canal wall, on the left side. Mastoidectomy of left side was done immediately. No pus was found, but the bone showed a streptococcic infection. The child grew worse and died. Necropsy failed to show any other pathology.

(2) C. J., aged 1 month, came to the hospital for feeding care. Patient gained weight and did well for two weeks. Then weight became stationary for 6 days, accompanied by a slight elevation of temperature. The number of stools increased. Then there was a rapid loss of weight, with evidence of dehydration. Fluids given parenterally. Fever 102°. Stools increased—as many as 21 during 24 hours. Otolaryngologist's report was that pus was in both sides of the nose; diagnosis, paranasal sinusitis. Local treatment was instituted, argyrol in the nose and suction daily. Within two weeks' time he had regained all the weight lost, and recovery was uneventful.

In both cases the clinical picture is much the same. The local pathology was in each case not marked and in each required a very careful examination on the part of the otolaryngologist to find the focus. In cases of this type it is striking how quickly results are obtained without any change in the diet, when the focus is eradicated. As to the one case in which the patient died, it is not infrequent that there is such an outcome, because, as in this case, the patient is nearly moribund before operative procedure is instituted. This is, in a measure, due to obscurity of the local manifestation. Similar cases have come to necropsy in which the only pathology found was in the mastoid antrum, and before death there were not sufficient signs to lead one to suspect an infection in this region. Fluid given parenterally seems not to check the dehydration but, if it does anything, seems to increase the diarrhea[1].

In the treatment of diabetes mellitus one is continually troubled with infection, which is more difficult to manage than in individuals free from the disease. When infection does occur, it is evidenced promptly by appearance of sugar in the urine in variable quantities, without altera-

tion of diet or insulin dosage. While the infection persists, there is an instability of the diabetic condition that causes one much worry—watching for insulin shock and diabetic coma. Here again infection of the upper respiratory tract causes much of the trouble. As soon as the infection is cleared up, there is a rapid return to stability of the diabetes.

Case Reports: (1) V. H., aged 8 years, returned to the hospital for check up of her diet and insulin dosage. She left the hospital on her previous admission sugar-free and on an insulin dosage of 24 units daily. On her return she was showing great quantities of sugar in the urine. There was an insulin requirement of 152 units daily to render her sugar-free. Examination was essentially negative, except for a temperature daily of approximately 99° F. X-rays were taken of her sinuses, and there was a marked blurring of the right maxillary sinus. Both sinuses were rasped and thick pus obtained from the right and a few flakes from the left. The pus on culture grew streptococci. The sinuses were treated twice a week until the condition cleared up. The insulin requirement fell rapidly, without a change in the diet, until on discharge she was receiving 37 units daily. She returned home stabilized and in very good condition.

(2) B. D., age 4 years, a new patient who came to the hospital for dietary adjustment and establishment of insulin dosage. There was a daily requirement of 56 units of insulin to get him sugar-free. Examination of the nose and throat revealed a chronic tonsillitis, with a blurring of the right maxillary sinus on x-ray. The tonsils and adenoids were removed and both sinuses rasped. Thick pus was obtained from the right side; none from the left. On culture, staphylococci grew. The sinuses were treated twice a week, and the condition cleared up. The daily requirement of insulin was 31 units. No change in diet.

Conclusions: (1) It is well to keep in mind that numerous marked disorders of a systemic nature are due to, or are closely associated with, infection of the upper respiratory tract; (2) that these foci of infection often require repeated and very careful search to find them; (3) that these foci, when found, are often apparently very slight, when compared to the systemic reaction, and (4) that a great many cases clear up rapidly when the foci are eradicated.

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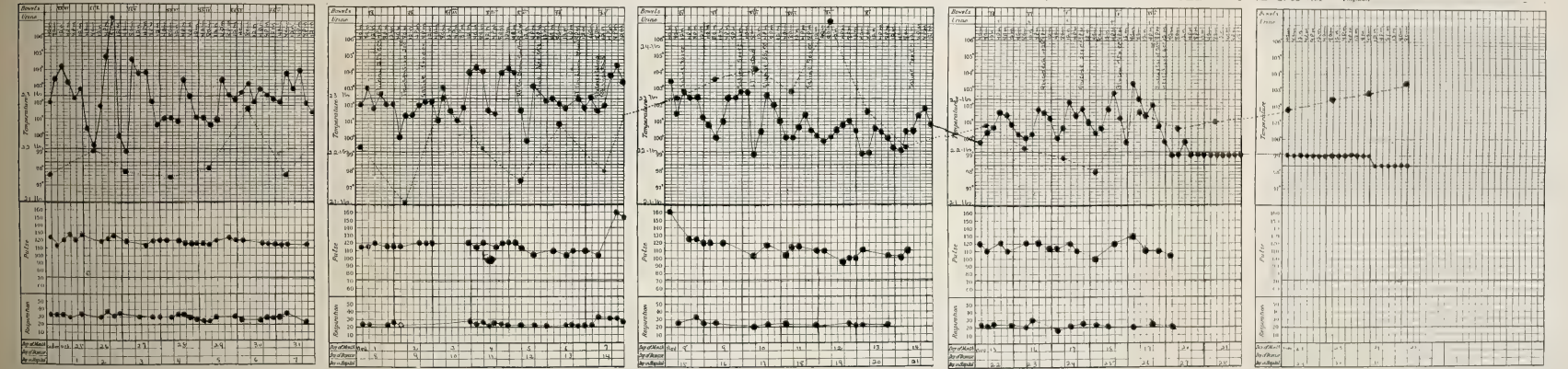

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DISCUSSION

Dr. J. Buren Sidbury, Wilmington: (Showing chart)—This case represents one of the type of cases which Dr. Knox has described. I wanted to bring out the point that the child showed a systemic infection and that his symptoms were diarrhea and a temperature from 102° to 106°. This red line is the body weight, showing how rapidly he lost weight. He got glucose and saline repeatedly. The weight is a very striking index of the ability of the body to hold or retain fluids. Along about November 1 his ears began to be red. He was examined frequently, and we couldn't find any respiratory symptoms. On November 5 the right ear drum ruptured of its own accord. The next day the other ear drum was opened by an ear man, who said the drum was not bulging but that it had better be opened. The child was apparently moribund. On November 7 he was given morphin (gr. 1/60) and the right mastoid opened under local anesthesia, and the following day he was fifty per cent. better. We obtained a few drops of turbid, watery pus from the right mastoid. On November 10 he was better, and a second operation of draining the left mastoid was done under local anesthesia. His recovery was very remarkable after this. November 18 he began to flare up again, showing some signs of infection. Mercurochrome intravenously was given November 19, and he had no more fever. This is a case of focal infection with very indefinite signs, and it was the mastoid operations which caused the child to recover. He is perfectly well to-day. Without operation he would have been dead, and doing the operation under general anesthesia would have killed him. The case is a good illustration of Dr. Knox's paper.

Dr. Spencer P. Bass, Tarboro: I believe that the subject of upper respiratory infection confronts those who treat children more often than the question of feeding. I believe these infections usually originate in the adenoids. Of course you can't see the adenoids, but very often an odor of pus leads us to this opinion; and the enlarged cervical glands during convalescence confirm the diagnosis. The tonsils in such cases may look normal, but it is a question whether they actually are normal or not. Often the adenoids when taken out show definite change, while the tonsils will show little change. There is no question but that upper respiratory infections, which produce so many kinds of symptoms, are on the increase. I think that there are organisms which select by preference the tonsils and the adenoids and there produce the numerous systemic symptoms. One case of bad tonsils in a family usually means other cases. I am often asked, why the adenoids and tonsils? Sometimes I am almost tempted to answer that they are to us as is the appendix to the surgeon, because they furnish us much occupation. One

symptom most prominent in upper respiratory infection is abdominal pain. I had a case in a child eight years old, who came to me much underweight and with a history of frequent attacks during the past two years of vomiting, with excruciating pain in the abdomen. The pain dated from the time when he had had diphtheria. Inquiry showed that seven of his immediate companions had had diphtheria during the past two years. His tonsils and adenoids were much diseased, and one antrum was cloudy. A culture from his nose showed diphtheria. Cleaning out his nose and removing his tonsils and adenoids brought about immediate improvement. He gained weight and for two years has had no return of the pain. Fortunately he escaped an operation for appendicitis.

If you will pardon me, Mr. Chairman, I should like to comment on a statement which you made in your paper, though I suppose it is out of order to give it at this late time. But I am doing it for the reason that on several occasions I have spoken favorably for intraperitoneal blood. I want to say I am done with intraperitoneal blood. I have used it a good many times during the past years, and it has certain advantages. It avoids frequent transfusions, because you can load up with it, and it is taken up gradually. The case which cured me I should like to mention briefly. I thought the case was ideal for intraperitoneal blood. He got it. He continued to cry after the administration of the blood and cried for about two days, except when he was under the influence of a narcotic. What happened was that he got a complete paralysis of the bowel and had so much gas that it interfered with his respiration and circulation, so that he was blue. That same child received the same citrate and the same blood intravenously once before and once after that without any bad effects. I had a letter recently from Dr. Roupe in St. Louis, who said that Dr. Marriott had given orders that no more intraperitoneal blood should be given.

Dr. Knox (closing the discussion): As I said before, very many of these systemic conditions are due to infections of the upper respiratory tract, and we must keep them constantly in mind. They are not easy to find, and it requires repeated examinations to locate the trouble.

ALPHA-LOBELIN AS A RESPIRATORY STIMULANT

Chas. P. Mangum, M.D., Kinston

It is not the purpose of this paper to go into the pharmacology of this drug, but it might be well to mention its source. Alpha-lobelin is the isolated active principle of lobelia inflata. It is a single, crystalline alkaloid. The hydrochlorid salt was selected because of the readiness with which it is broken up, absorbed, and eliminated. It has no tendency to produce nausea and vomiting, as had the amorphous mixture of alkaloids used prior to its isolation by Heinrich Weiland.

This drug acts as a specific stimulant to the respiratory center without any appreciable effect upon the rest of the organism. The action takes place very quickly, usually within thirty seconds to one minute, increasing both the rate and amplitude of respiration. It is indicated as a resuscitant in emergency cases where respiratory failure is menacing life. I have found its chief use in the treatment of asphyxia neonatorum. On account of the many incidents during labor the new-born is not infre-

quently threatened with asphyxia, which, unfortunately, does not always respond to the usually employed methods of treatment. In fact, some of these result in actual damage to the little patient. Rupture and displacement of the delicate organs may result from too vigorous manual methods, and an insufflation pneumonia may be an embarrassing sequel.

Alpha-lobelin is administered intramuscularly, the site of choice being the gluteal muscle; and the action, as stated, will usually appear within thirty seconds to one minute. My rule has been to repeat one-half the dose in fifteen minutes if the case has the appearance of a desperate one. The drug may be given intravenously if the circulation is feeble and instantaneous action is imperative. The dose I have been using in newborn infants is 1/40 to 1/20 grain, intramuscularly.

The following are two typical cases, which are quoted to show the prompt action of the drug:

Case 1.—Baby H: Forceps delivery of an occiput posterior presentation after prolonged, tedious labor. The cord had prolapsed and was pinched by the presenting head. The obstetrician had kept the infant alive by artificial respiration for about 45 minutes. When seen it presented a picture of marked asphyxia livida. The heart action was fairly good—beating 110. Alpha-lobelin grain 1/40 was given intramuscularly immediately and artificial respiration continued for two minutes. Voluntary respiration was established with this, but it was superficial and arhythmic. One-sixtieth grain was repeated after five minutes had elapsed, with the establishment of normal respiration.

Case 2.—Baby M: This infant was a premature baby weighing 5 pounds and 12 ounces. It was born after a rather precipitant labor. The cord was tied in two distinct knots about 8 to 10 inches from the umbilicus. Artificial respiration was used as in the above case for about the same length of time. One-fortieth grain alpha-lobelin was given into the gluteal muscle, with the establishment of normal respiration in two minutes.

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DISCUSSION

Dr. A. McR. Crouch, Wilmington: Alpha-lobelin is nontoxic, and it has quick action. Those two things give us a needed support in emergencies. You don't have to wait more than thirty seconds or one minute for the action of the drug, which stimulates directly the center which has been depressed. To me it seems one of the most valuable drugs that has been given us in the past decade.

Dr. Mangum (closing the discussion): I might mention that alpha-lobelin is of great value in collapse in any surgical procedure. We have found it of great value in such instances.

THE PRACTICAL APPLICATION OF RECENT ADVANCES IN PEDIATRICS

Marion Y. Keith, M.D., Department of Pediatrics, Washington University School of Medicine and the St. Louis Children's Hospital

During the last few years much has been learned regarding the feeding of infants. Complicated formulas of the past have been dis-

carded as unnecessary, and simple mixtures of milk and sugar have been substituted. It has been learned that the chief causes of difficulty in the feeding of infants are underfeeding and infection. If the baby is receiving a sufficient amount of suitable food and develops a gastro-intestinal upset or fails to gain in a normal manner, the condition will not be benefited by change of the formula, but the source of infection must be sought for and remedied.

The infection in question may be in the gastro-intestinal tract or in some other part of the body far removed.

In infants, the ears are the most common seat of infection, and therefore our attention should be directed to the ears in every case. Abnormal changes in the ear drum can only be recognized by repeated examination of the normal. There are certain types of cases in which the changes in the drums are very slight; so slight, indeed, as to be entirely overlooked by most otologists. The drum may be neither red nor bulging, but it has lost its luster and is of an opaque, dull gray appearance. Often the diagnosis of otitis media must be made by exclusion rather than by the local signs of inflammation. The responsibility for the diagnosis rests with the pediatrician rather than with the otologist. These patients show little or no prostration, no diarrhea; the patient vomits at times and is therefore not able to assimilate food; the color of the skin becomes pasty; and the patient will not gain in weight at a normal rate. Paracentesis of the ear drum results in free drainage of pus, and the organisms recovered from culture in such cases are usually staphylococci.

Again we see cases in which there is a marked elevation of temperature, extreme prostration, much vomiting, profuse diarrhea, and a most rapid loss of weight. Examination of the ears reveals a red drum, slightly full or bulging or only with red streaks extending onto the drum from the canal wall. Paracentesis reveals usually thin pus, and the organism recovered is a streptococcus hemolyticus. This is the type of ear infection which proves most serious, as the mastoids become involved, and the course is most often rapid and fatal. Again, we see types of cases in which there is not sufficient opening in the drum and drainage is inadequate. There is a definite sag in the posterior superior canal wall just external to the drum membrane. This is the type in which sufficient drainage cannot be obtained through the drum, and such must be made through the posterior auricular route. Drainage by the posterior auricular route has now become quite common in infants; and the classical signs of redness, tenderness, and swelling around the mastoid region need not be present in order to make a diagnosis of mastoiditis.

Again, as a seat of infection, and especially in the presence of discharging ears, enlarged adenoids must be considered. All adenoids should be removed routinely in the presence of chronically discharging ears. An examination of the urine should be made at frequent intervals in the presence of such infections, as the kidneys sooner or later become secondarily involved if the condition is permitted to continue for a considerable time.

In older children, too much emphasis cannot be laid upon the necessity of sinus investigation and properly directed care and treatment. Associated with this condition there are certain types of cases in which the symptoms point to a nose or paranasal infection, the condition simulates

tuberculosis, and a mistaken diagnosis of such is often made. In these cases there is an enlargement of the postcervical lymph glands. However, these patients do not show a positive von Pirquet or tuberculin test. X-ray examination reveals an involvement of the mediastinum, an enlargement of the bronchial lymph nodes, a thickening of the hilus shadow, and much mottling of the parenchyma throughout the lung.

In the above discussion we have mentioned urinary infections as secondary to foci of infection elsewhere. It is now my purpose to mention a few conditions in which the urinary tract is a primary seat of infection. It is in this group that we find the symptoms of high fever, vomiting, pain referred to the region of the urinary tract, chills, diarrhea, loss of weight, and a waxy color of the skin. Pyelitis is usually due to an infection with the colon bacillus. This type of infection is rather self-limited, the condition decreasing as the body is able to build up an immunity by the production of antibodies. Again, the condition may go on to multiple abscess formation in the kidney. The treatment in such cases is to give urotropin in large doses (5 to 7 grains every four hours to an infant). In order to render the urine acid, calcium chlorid or ammonium chlorid in a dosage equal to that of urotropin is given. Frequent transfusions and glucose as a diuretic agent are quite beneficial.

There is still another type of pyelitis in which the symptoms date back to birth. Investigation shows that the urine contains persistently much pus. Staphylococcus, colon bacillus, and many of the secondary infecting organisms may be found. Extensive treatment has been given, especially much soda bicarbonate, but the condition persists. This type of case falls into the group of congenital abnormalities of the urinary tract. A definite diagnosis cannot be made upon the clinical symptoms, and cystoscopic and x-ray examination are of vital importance in making a diagnosis. These cases will show some defect of the urinary tract, such as an accessory kidney, enlarged dilated pelves, dilated ureters, constricted ureters, enlarged ureters with very thick walls without dilation. Sometimes a congenital defect such as diverticulum of the bladder is noted. The treatment of this type of case is purely surgical. Frequent transfusions of physiological saline and glucose solutions are beneficial in decreasing the operative risk.

What has been said above concerning the nature of infection and its related symptoms and treatment outlined has been ideal in that it can be carried out in a hospital practice. In private practice, however, it is often necessary to give treatment directed to relieve certain symptoms. This procedure is justified provided the real causes of such symptoms are borne in mind and treatment is directed towards relieving them.

Two symptoms which are commonly associated with infection are fever and vomiting. It is my purpose to discuss these symptoms briefly, with the idea of pointing out the harm which sometimes may result from certain forms of treatment.

If an infant or child vomits sufficiently he will lose gastric juice as well as food which he has taken. Gastric juice contains a considerable quantity of hydrochloric acid and a small amount of sodium chlorid. Ordinarily the chlorid from both sources is absorbed by the intestines and the tissues, and the blood does not lose chlorids permanently after secretion of such into the stomach. If, however, the stomach content is

lost through vomiting, the chlorid is lost; and if vomiting is persistent, it will not be long before the body may lose as much as one-half of its entire store. Under such conditions there comes into play a protective mechanism which keeps normal the total salt and crystalloid content of the body and thus keeps normal its osmotic pressure. Secretion of chlorids by the urine ceases, and there is a retention of bicarbonate which in a measure replaces the lost chlorid. So, as a direct result of the vomiting, the bicarbonate content of the blood and tissues may for a time rise above the normal. Such infants have alkalosis, and administration of sodium bicarbonate by mouth is exactly the thing which should *not* be done. It is well to emphasize this point, because it is quite a general practice to give sodium bicarbonate for vomiting and to relieve acidosis. Yet vomiting in itself does not produce acidosis, but an alkalosis; and it is practically only in rare cases such as cyclic vomiting that severe acidosis is associated with marked vomiting. Since, however, not only hydrochloric acid is lost through vomiting, but also sodium chlorid, the body can not maintain its normal salt concentration by substituting the bicarbonate for chlorid; and in any marked case of pyloric stenosis, where vomiting is severe, we find not only a high sodium bicarbonate content of the blood, but also a high non-protein nitrogen as well. In such cases as these urea has been retained to a degree sufficient to retain a normal osmotic pressure of the blood serum. This retention does not mean a nephritis in spite of the fact that albumin and casts are found in the urine, as is the case when anhydremia exists. The type of case that usually shows the changes mentioned is that of organic stenosis or intestinal obstruction; but identical changes are seen in cases of pyelitis and mastoiditis—i. e., pyelitis with vomiting and fever. The practical point to bear in mind is that in the presence of marked vomiting one may expect an alkalosis and signs and manifestations of tetany, which may be severe enough to cause generalized convulsions. The diagnosis need not be made through extensive blood chemistry study, since the urine in such cases shows the characteristic absence of chlorids. It is noteworthy, however, that the urine in cases of alkalosis may be quite acid. The simplest test for chlorids in the urine is to add a few drops of silver nitrate after the urine has been acidified. A white precipitate is seen if chlorid is present.

Treatment directed towards bringing about a restoration of the normal relation of such substances of the blood is simple and consists in giving a sufficient amount of a physiological solution of sodium chlorid, which may be given intraperitoneally or subcutaneously or in a three per cent. solution subcutaneously. When the chlorid content of the blood is replaced in such a manner, the body excretes rapidly both the retained bicarbonate and non-protein nitrogen; and this automatically lessens the danger of tetany alkalosis.

Fever is another common symptom of infection that causes increased pulmonary ventilations. It is not unusual in the presence of fever to have a breathing which resembles that seen in severe acidosis. The blood of such patients when examined reveals most commonly an alkalosis. The explanation is simple. Fever causes an increased respiration, which in turn causes a washing out of too much carbon dioxid from the blood. The ratio of free carbonic acid to sodium bicarbonate becomes altered,

and the reaction of the blood shifts to the alkaline side. The practical application of this knowledge lies in the fact that one should not be misled by simple hyperpnea in making a diagnosis of acidosis, particularly if fever is present, without confirming the diagnosis by urine examination. Usually the urine is alkaline to bromcresol-purple (i.e. turns purple) in fever, but never so in the presence of acidosis except when the latter is associated with marked renal impairment.

We have seen that soda is directly containdicated in the treatment of vomiting. However, soda is of value and is widely used in the treatment of pyelitis. One would naturally suspect, however, that soda would be harmful when given to patients with pyelitis when vomiting. This is true, and there exists still another reason why soda bicarbonate in large doses should not be given in pyelitis, as alkalosis develops or follows.

However, there is one point which has been of particular interest concerning pyelitis, and that is the frequent high alkali tolerance which some patients show. These patients may require very large doses of soda before the urine becomes alkaline; and it is particularly in such cases as these that convulsions may occur, due to large administrations of soda. One reason for the high tolerance is that mentioned above, when vomiting has been a pronounced symptom. Chlorids are lost; the total salt concentration of the body falls below its normal level. When soda bicarbonate is given it is retained in the body until normal salt concentration is reached. This may result in marked alkalosis with convulsions. The practical point to be remembered in such cases is that when ordinary doses of sodium bicarbonate have been given and the urine does not become alkaline, the administration of sodium chlorid will cause the excretion of sodium bicarbonate to such an extent as to make the urine alkaline, and by doing this alkalosis is avoided. Another reason why cases of pyelitis will not put out sodium bicarbonate in the urine, although very large doses have been given by mouth, is that there is associated a nephritis in which there is an inability to secrete normally soda bicarbonate, and therefore there is a retention of alkali.

SUMMARY

1. The ears are a frequent focus of infection during infancy. Mastoid infection is also common, and in these cases the classical signs of mastoiditis are often lacking. The diagnosis has to be made on the basis of the general symptoms rather than local manifestations.

2. In older children infection of the nasal accessory sinuses is common and often unrecognized. The symptoms are often mistaken for those of tuberculosis.

3. Persistent pyuria may be the result of foci of infection outside the urinary tract or may be due to congenital malformations. This latter condition can be diagnosed only by cystoscopy.

4. Alkalosis is a fairly common condition. It occurs regularly in the presence of vomiting. In such cases the administration of sodium bicarbonate is fraught with danger.

DISCUSSION

Dr. T. M. Watson, Wilmington: Dr. Keith mentioned, as one of the chief advances, the substitution of simple milk and sugar formulae for

the more complicated ones of former years. Lactic acid milk has solved the problem and has saved the lives of many babies. It has also saved many drops of sweat on the brows of their doctors, who used to spend endless hours trying to figure out the exact percentage of F, C, P, and salts to be given to each well baby and a starvation percentage for each sick one on their lists. Now you can feed them all on the same food. The premature baby, the well baby, and the sick baby can all eat from the same platter and thrive. Three years ago, Dr. Marriott made a prophecy that sounded rather rash, but one which has almost come true. He said that before many years we would have a huge tank in the center of the ward, filled with a rich mixture of lactic acid milk and Karo syrup; from this tank little pipes would stick out in every direction; every four hours each baby in the ward, sick or well, normal or premature, would roll up in his crib, slip a nipple on a pipe and drink his fill from the common supply. We are feeding all the dysentery cases on lactic formulae, instead of barley water as we formerly did, and they are living instead of starving to death.

In regard to focal infection, more has been done along this line than in any other branch of pediatrics; and cases that used to die, on account of absorption from a hidden focus, are getting well after having these foci eliminated. Most of these foci are to be found in the nose, throat, ear, and accessory sinuses. We are finding that the majority of diarrhea cases are the result of local infection. We used to think that if there was blood in the stool it was surely dysentery infection. We ran a large series of stool cultures on children with diarrhea admitted to the St. Louis Children's Hospital in 1923. Out of several hundred, only eighteen showed dysentery bacilli. The others had diarrhea due to focal infection; most of them cleared promptly, on removal of the focus. We have had a number of cases with diarrhea, some of them having as many as thirty stools a day, which cleared at once on elimination of a definite focus.

Last fall we had a little fellow with acute pyelitis in the James Walker Memorial Hospital. When he came in the temperature had been high, 104° to 106° for four days before coming. He had large adenoids that almost totally obstructed nasal breathing; his urine was loaded with pus. We found nothing else of note. We put him on the usual alkaline treatment; the temperature came down to normal by the third or fourth day; the child was taking and retaining food; but the urine was still loaded with pus. At the end of a week the urine showed no sign of clearing, so we switched to the acid treatment and gave urotropin in full doses. He got along all right, took his food and gained weight; but the urine was still loaded with pus. His mother did not believe in operations and held that if God put adenoids there they ought to stay there. The day they went home we told the father that we felt that the adenoid was the focus and, after getting his permission, took the baby in the treatment room and took the adenoids out under "vocal" anesthesia, and let them go home. Three days later they sent a specimen back. It showed only a thin scattering of pus, where it had been loaded. A week later there was not a pus cell to be found. We kept check on this case for more than two months, and there was no return of the symptoms, so we decided that the adenoid growth was the focus of infection.

As to ears, I have an awful time trying to decide when to open and when to let them alone. Year before last, I opened them all; this year I open mighty few. If there is an acute syndrome, such as that described by Dr. Keith as the acute streptococcic ear, and the drum is dull and full, or bulging, then I think the sooner it is opened the better it is for the child. If, however, there are no acute systemic symptoms, even though the drum is definitely bulging, I feel that it is the part of wisdom to let it alone and watch it for a few days. Many of these will clear up, and we have no idea how much infection we carry in on the tip of that little knife.

We had a child at the Walker Hospital three weeks ago. He had a little attack of vomiting and fever a day or two before we saw him. When we saw him, the acute symptoms had subsided. Examination of the ears showed definite bulging of both drums. Dr. Disosway, one of the internes, had been wanting to do some cutting, so we decided to let them go over until next day and let her open them. When we came in the morning, the left drum had gone down almost flat; it having behaved so beautifully, we decided to give the other one a chance. The next day, this one had cleared considerably. Within a week all signs had cleared, and the child seemed perfectly normal and went home. Had we opened the drums, the ears would probably have drained for several weeks.

Dr. Spencer P. Bass, Tarboro: I would like to make a comment with regard to acid milk. We see a few babies who can't take it. They have sufficient acid and don't need any more.

Dr. Watson mentioned taking out adenoids under a local anesthetic. I am quite partial to ethyl chlorid. You can get just the degree of anesthesia you want, and so far I have seen no bad results. There is no danger unless it is continued too long. I speak very strongly for the use of ethyl chlorid as an aid in opening the drums and in other small operations, particularly in the removal of adenoids.

Dr. Keith (closing the discussion): Dr. Watson's remark about feeding all the babies with tubes connected to one tank of milk is almost true. At the St. Louis Children's Hospital we have only three formulas that we give patients when they enter the hospital. One is one ounce of Karo syrup to a quart of whole lactic milk; the second is two ounces of Karo syrup to one quart of whole lactic milk and the other three ounces of Karo syrup to a quart of whole lactic milk. When a patient enters the hospital the intern specifies which one of the above formulas the patient is to have. The formulas are altered very little, regardless of the symptoms of the patient. The focus of infection is sought for and treatment directed towards it. With my respects to the otologists, we have had difficulty in getting them to open ears and do a mastoidectomy early enough. The patient shows all the symptoms of infection of the ears and upper respiratory tract, but they will only take care of same or operate upon same when insisted upon by the pediatrician. Because the classical signs of mastoiditis are not present the tendency is to delay the operation, which is most often harmful to the patient. It is the practice of Dr. Marriot to open these ears often against the wishes of the otologists, and pus is most often obtained.

SOME OBERVATIONS IN ENLARGED THYMUS

W. C. Verdery, M.D., Fayetteville.

I have selected this subject for two reasons: first, because there is very little known about it; and, second, that it may stimulate some of you to bring to light some of your experiences with this condition that will be of great value to all of us.

To-day the thymus is recognized as an intrathoracic gland which continues to grow up to and sometimes beyond puberty, varying in size and response to certain cosmic influences, such as change of climate, alterations of season, etc. The average weight of the thymus is 10 grams. It seems to have a closer relationship with organs of the male than the female. Less is known about this gland than any of the other endocrine glands. It overlies some of the most important structures in the body, as it is in the critical space between the manubrium sterni and the vertebral column, which in infancy measures two to three c.m. Considering the position and relationship of this gland to its immediate surroundings and its limitations of space for growth, it can readily be understood that any abnormal growth would tend to cause considerable pressure and produce symptoms that we have observed in persistent thymus enlargement. It is upon this finding that some of our observers believe that the symptoms elicited in enlarged thymus are due entirely to pressure. However, many observers produce evidence that pressure plays only a small part in the production of the symptoms that lead us to make a diagnosis of enlarged thymus.

Dr. J. B. Harris, in the *American Journal of Diseases of Children,* March, 1924, states he believes that the thymus is not a transitory organ but functions up to old age. He said Hassall's corpuscles present the functional changes and form the morphologic expression of antitoxin activity. None of the evidence as to internal secretion from the thymus is conclusive. At puberty the parenchyma begins to reduce, but this involution does not check the antitoxic action of the gland. Roentgen irradiation disintegrates the lymphocytes; and for a time, at least, the thymus is changed to a purely epithelial organ.

Dr. Isaac Abt thinks that the thymus grows from birth until the age of two years, after which it decreases in size and undergoes degenerative changes. Dr. Abt is very indefinite as to when to and not to make a diagnosis of enlarged thymus. Using all means of diagnosis, he further states that he is undecided as to why these symptoms present themselves.

The varying opinions of observers narrow the conclusion down to two paths: one to mechanical pressure by the thymus on the respiratory passage or on the nerve element of the trachea, producing death by inhibition. Others ascribe the symptoms to hypertension of the thymicolymphatic hormones (special irritability of the nervous system, which reacts to various stimuli by cardia paralysis or by anaphylactic phenomena). It has been clearly shown at autopsy that infants dying from apparent thymus death do not show any enlargement of the thymus or apparently any evidence of structural change of the thymus gland.

In a few instances thymic death occurs within the first hours of life. However, enlarged thymus cases may go for a long time unrecognized, especially when the symptoms are not acute. The failure to recognize this condition may prolong the child's illness or may lead to sudden death from an operation such as tonsillectomy.

The classical symptoms are dyspnea, cyanosis and an inspiratory stridor, but if one depends upon this trio of symptoms many cases will go unrecognized. A cough of dry, brassy character, especially choking, appears frequently and in paroxysms. These spells will often come on at night when the child is apparently well and no evidence of cold is present. Examination of the throat by men specializing in that branch will not reveal any abnormality.

The following symptoms, while not characteristic, should suggest advisability of an x-ray examination: (1) Inability to cry, or the loss of voice; (2) Crowing respiration with crying; (3) Noisy or wheezing respiration during sleep; (4) Difficulty in nursing; (5) Throwing back the head, twitching of muscles, and fretfulness; (6) Feeble respiration; (7) Grunting as if child was having a stool; (8) Failure of child to gain in weight in spite of proper dietary measures.

The physical signs of enlarged thymus are well known by all of us, but the diagnosis is usually made by x-ray study. However, in one of my cases the x-ray did not show very much broadening of the gland. The gland was very thick, and the enlargement was from the front backwards rather than from side to side.

The x-ray technician must have much training along these lines to obtain good results both in picture and in treatment. These little patients are very hard to keep still while the picture is being made; therefore instantaneous pictures must be made. All premature and deformed babies should be examined for enlarged thymus, for in these babies most of our cases are found. The evidence of thymic enlargement is the presence on the radiographic plate of an increased triangular shadow lying above the heart's opacity with the base of the triangle about coincident with the upper border of the sternum. The proper interpretation of the x-ray plate requires experience.

A few conditions in early infancy which may be confused with persistent thymus are (first) papilloma of the larynx. In this condition the voice changes are very marked, the x-ray plates are negative, and such growths do not enlarge to such a proportion during the first eight months of life as to give any symptoms characteristic of persistent thymus. Second, congenital laryngeal stridor is very often confused with thymus enlargement. However, this condition usually is continuous in its stridor, without cyanosis, and position does not change or exaggerate it. The stridor is confined entirely to inspiration; and in children old enough to have acquired pathology in the chest a differential diagnosis must be made for enlarged glands, new growth and collection of fluid or pus. This usually can be done by x-ray study.

Once the diagnosis is made, the only satisfactory treatment is radiation, either with x-ray or radium. Care should be used in the application of either. Much care should be used in holding the baby so that there will be no shock from the high tension wires in the x-ray room. I shall not discuss the radium treatment, as I have had no experience with ra-

dium. The earlier the treatment is instituted, the more satisfactory is the result. If the condition is recognized immediately, one or two exposures are often sufficient to cure the patient; but in cases recognized later in infancy and childhood, sometimes four, six, or eight exposures must be given. These treatments are usually begun with one-eighth to one-third erythema dose and treatment repeated in from ten to thirty days, depending upon the yielding of the gland. The very acute cases appearing immediately after birth may be controlled by adrenalin chlorid hypodermically until x-ray treatment can be instituted.

Case report: Baby J., the fourth child of a family with healthy mother. Father had some evidence of pulmonary tuberculosis four years previous to this child's birth. The baby was premature about three weeks; normal delivery. The baby did not cry vigorously at birth and the third day lost its voice entirely. Physical examination was made to determine whether the thymus gland was enlarged. This, however, proved negative. The baby developed noisy respiration with attacks of cyanosis, the attacks being more severe at night. This case came under my observation at the seventh week. Physical examination showed apparently normal baby, slightly underweight, with inspiratory stridor, and impaired resonance on light percussion over manubrium sterni extending to right and left of the parasternal margin about two cm. at second intercostal space. I did not notice any abnormality of the throat or of the respiratory organs. The child was free from any inflammatory process in the chest, but the cry was weak. The inspiratory stridor was more marked when the child was lying down or head extended upon the body. The child did not nurse vigorously, and food was taken very reluctantly. The x-ray failed to verify my findings; but the symptoms continued, and I saw this baby three weeks later. When the baby was put on its back it would often present a picture not unlike Cheyne-Stokes respiration. In spite of x-ray finding I made a diagnosis of persistent enlarged thymus. Further x-ray study showed marked thickening and broadening of the thymus, and x-ray treatments were given immediately. Marked reaction followed the first treatment—vomiting, diarrhea, and loss of appetite. These treatments have been given at intervals of two to three weeks. No further reaction has occurred; all signs of cyanosis have subsided; and the baby has gained weight rapidly. Noisy inspiration has disappeared, and all physical signs are absent. The child is perfectly normal at the present time, being eight months old and weighing nineteen pounds and ten ounces. Eight treatments have been given. The treatment other than the x-ray was general hygienic measures, proper diet, fresh air, sunshine, and codliver oil.

DISCUSSION

Dr. J. Buren Sidbury, Wilmington: Enlarged thymus is present a great many more times than we realize, and I think a child that shows any of the above-named symptoms should be x-rayed to determine whether or not is it present.

NOMINATION OF CHAIRMAN

Dr. Spencer P. Bass, Tarboro, was nominated for recommendation to the President as chairman of the section for next year.

SECTION ON EYE, EAR, NOSE AND THROAT

CHAIRMAN: O. C. DANIELS, M.D., Oriental.

CHAIRMAN'S ADDRESS

O. C. DANIELS, M.D., Oriental.

It has been the custom in societies such as this for the presiding officer to present a scientific paper, usually based on his personal observation or research or concerning some subject in which he is personally interested. The former I have left to those who will follow me. I have chosen the second as my alternative.

Back in 1913, when I had completed my post-graduate work in eye, ear, nose and throat diseases, I decided to see what was going on in our line of work in various places in Virginia and North Carolina. Incidentally, I was looking for a location at the same time. In visiting various cities and towns, I found, of course, many different ideas and ways of doing things. When taking my post-graduate course I was especially interested in diseases of the nose and throat; but in visiting various physicians in various places I did not find many men very enthusiastic in nose and throat work, most of them being interested in eye work. By interested, I mean they were enthusiastic and seemingly doing good work. The nose and throat work as practiced then, certainly the surgical end of it, was crude and unproductive of good results.

Having paid special attention to nose and throat work and feeling that I was competent to do good work and give the desired results, I was sadly disappointed in not getting any work to do. If I said "operate" to a patient I did not see my patient any more. He or she at once said, "I never heard of a nose or throat operation doing anybody any good. They all have to be done over." I had been located over six months before I did any nose surgery. That was a submucous resection, and I am not sure my patient knew what I was doing. At any rate he did not pay me. I might have thought the trouble in me, but I was doing what I called really well in eye work. Then I was convinced it was due to poor nasal and throat surgery previously done. I well remember what one of my teachers said: "If you can do a good tonsillectomy and a good submucous resection your success is assured. You know a good operation goes much further than just good and exact surgical technic or procedure. You must do a painless operation, one that suits the operator and gives the patient relief, both physiological and mental." This last certainly is not to be ignored.

Eye work as practiced back in 1913 certainly was good; I may say almost as good as at the present time. Eye work has not gone forward as has nose and throat work. The better training of nose and throat men, with the rapid advances in nose and throat work, and the fascination of surgery, as well as the education of the public along our line (and incidentally a better fee) have made more nose and throat men, and in proportion fewer eye men, than ever before.

Ophthalmology. What is more satisfactory than eye surgery? What is more productive of good results? Nothing. From the smallest operation, the removal of foreign bodies from the conjunctiva, to a cataract operation, what gives the patient more relief and pleasure? Nothing. Those of us who have been in harness for some time can look back and think of the grateful patients who were blind but now see, who had glaucoma pains but now are resting easy—I do not mean *dead,* either. I well remember an old negro who had been a county charge for twenty years, due to cataracts. I removed one cataract with good results, and that old negro paid me regular visits as long as I was in Goldsboro. He said that he would not take all the world for the sight I had given him. Such cases as these make ophthalmology very fascinating and satisfactory. But there is to the average ophthalmologist one bugaboo, and that is refraction. Refraction to-day, as a rule, is not any better than it was fifteen years ago. To the average oculist it is too tedious, tiresome, and too unsatisfactory. The patients are unsatisfied because they are not properly refracted.

Refraction belonge to medicine and should be praciced by a medical man only, and one who has had special training in refraction and who likes refraction. There is no field for optometry, for refraction is more than mechanical optics. We all see cases that have gone bad because they did not go to an oculist instead of an optometrist. No longer than three months ago I saw a patient who had trouble with his eyes and had been to an optometrist and had glasses fitted, with no results. This patient came to me; and after a thorough examination I found he had high blood-pressure, albumin in the urine, and in my opinion had arteriosclerosis. Further examination showed two large, pussy, fibrinous tonsils. You all know my opinion of tonsils, and these shared the same fate as others. This patient, by carrying out the proper instructions, will not get well but will be more comfortable; and his life, no doubt, will be lengthened.

I might say the optometrist continues to do business because we do not produce better results than he does. Why? Not that we do not know more; but because we do not go into each case more thoroughly, give it more time and work out every minute detail, so that no man can do more. The oculist must be a thoroughly trained man in medicine and surgery, familiar with every branch of medicine. In addition, he must be a thoroughly trained oculist and must do his work so thoroughly that no man could improve on it. Last but not least, he must not forget to charge a respectable fee and collect that. This last is where the optometrist is 100 per cent. efficient.

We shall have to watch the optometrist to see that he does not get any legislative action that gives him more scope and lessens ours. One optometrist in a nearby city in our state went so far in a newspaper write-up as to say an oculist does not know how to fit glasses and should not be allowed to do so. Apparently some optometrists are seriously considering the advisability of treating the simpler eye diseases and performing the simpler operations. It is claimed by optometrists that we use harmful drugs in examining eyes and that we are incompetent on account of lack of proper training. We must teach the public the difference between an optometrist and an oculist. Just because the optometrist advertises and signs his name with the abbreviation "Dr.", a large majority

of the public think him a real doctor of medicine. I might say that when any of us have professional cards in the papers or our names on the register of office buildings we should follow the name with "M.D." and never prefix the abbreviation "Dr." The optometrist can not use "M.D." after his name. When I was in Dr. Thornton's office in Philadelphia he kept on his table little boklets explaining the difference between opticians, optometrists, and oculists. I think that would be a good idea here in North Carolina.

I wish to quote you from the *American Medical Journal,* under the heading "Current Comments", as follows: "I regard it as highly important that the ignorant and the unthinking be not misguided by the use of the title 'Doctor', because it presupposes in the minds of a great many people a knowledge of the human anatomy sufficient to enable the holder of such title to diagnose and prescribe for all the ills the human body is heir to. The title 'Doctor' should be made by law to mean what the great majority of people believe it means, and it should not be promiscuously bestowed upon individuals so lacking in proper qualifications as to be unable to tell the difference between indigestion and hydrophobia." Again, I quote from the committee on optometry of the American Medical Association as read before the last meeting at Dallas, Texas, in part as follows: "It is very evident that, whether we believe there is a legitimate field for the optometrist or not, he is here to stay and that he will continue to fit glasses until the people demand that it be done by qualified medical men. Our opposition to the licensure of the optometrist has not only been unavailing but is probably responsible in large part for his determination in some states to compel us to pass the examination of the optometry boards if we continue to do refraction. It is also evident that many optometrists are recognizing the fact that refraction is a medical problem and are examining the eye-grounds and the media with the ophthalmoscope and are desirous of using drugs to faciliate their study of the eye, the treatment of squint, etc. They are even taking the blood-pressure and examining the urine. We would suggest that a standing committee on optometry be appointed, of which no member of the present committee shall be a member, to aid the Bureau of Legal Medicine and Legislation of the American Medical Association to get in touch with men in each state who are definitely interested in this problem; to supply the profession with definite information regarding the present optometric situation; and to use pages of *The Journal of the American Medical Association,* the *Journal of Ophthalmology,* the *Archives of Ophthalmology,* and such other recognized journals as would most certainly reach the profession. We would also suggest the provision of a place, preferably the ophthalmologic department of the state medical schools, where intensive instruction in refraction can be secured by members of the medical profession at stated times during each year. Members of the medical profession should be informed of the attitude of the radical branch of the optometrists, and the legislative committees of the state and ophthalmologic societies should be warned to be on the lookout for the presentation of embarrassing legislative measures. The general practitioner should be thoroughly informed as to the relative function and services rendered by the optometrists, and all physicians who do refraction should be encouraged to avail themselves of intensive

courses in refraction provided by state schools. The ophthalmologists must be willing to give adequate time to teaching members of the profession who do refraction to do it well and charge enough for examination for proper remuneration. The ophthalmologists should coöperate with physicians in this matter. They should let it be known that physicians do not sell glasses in cities where there is a competent and honest optician. Our committee should try to get a list of optometric leaders who are honest and who would be willing to have conferences for the consideration of our mutual interests. It would be well if all schools of optometry were under the control of regents of the State universities, and full university requirements should be demanded for admission to the schools of optometry."

We believe with Dr. Jackson (editorial in the *American Journal of Ophthalmology,* August, 1925): "Who will prescribe glasses, and who will make them and fit them to the face, will not be finally decided by legislative enactment, no matter how many laws relating to it may be placed on the statute books. The attempt to create a profession by giving its representatives the power to say who shall and who shall not render certain service is doomed to failure. Any attempt to give a legal monoply for the prescribing or fitting of glasses to those who are not the most competent for that work may do harm and cause confusion for a time, but such monoply cannot be permanent. This applies equally to optometrists and to oculists. Those will serve the community who can serve it most efficiently and economically, those who have had the effective preparation for their work and have given the most time and energy to such preparation by the best planned course of study. Here is where the optometrists have failed to establish a profession."

We also believe that the public should be frequently and frankly informed of the function of the optician and that refraction is always a medical problem. This can be done by lectures and radio talks under the auspices of the county society and through the pages of *Hygeia* and other journals reaching the home. All abusive criticism of the optometrist should be avoided, as tending to act as a boomerang and inconsistent with the dignity of the medical profession. Our one hope is to keep them within the sphere of prescribing glasses and refusing to sell to those who present any evidence of disease of the eye or who can not be given practically normal vision with lenses.

In conclusion I wish to summarize my remarks as follows: (1) Everybody that is any way connected with healing the sick or alleviating suffering should have to have the same university requirements as required of doctors of medicine, for this alone would stop optometrists, osteopaths and chiropractors in the future; (2) the present crowd of optometrists should be allowed no more privileges than they have at present; (3) better educated and trained oculists are necessary; (4) there is room for more oculists provided they are better oculists, especially better refractionists; (5) simplified, easier, and better methods of refraction are desirable.

I should like to say here that Dr. R. L. Daniels and myself had planned to give you a paper with lantern slide demonstrations on a

simpler, easier and more accurate method of refraction, a method that can be used with atropin or without atropin, but we failed to get our slides. We hope to give it to you sometime in the future.

SOME INTERESTING CORNEAL ULCERS

Allan C. Banner, M.D., Greensboro.

Many of the diseases of the eye find their origin in systemic diseases or diseases of individual organs. I want to call your attention to the fact that focal infection in distant organs and tissues frequently leads to corneal ulceration.

Corneal ulceration may be caused by ectogenous infection; for example, infection following a slight injury to the cornea. Or it can be caused by endogenous infection, and it is this with which we are particularly concerned. Corneal ulceration of endogenous origin may be brought about by organisms being brought by the blood stream from the distant focus, or the bacterial toxins may be the direct cause of the ulceration. The different membranes of the eye are attacked with different degrees of violence. The cornea alone may be atacked or the retina, iris, or uveal tract; or even a panophthalmitis may be brought about. It is assumed that the microbes or their toxins possess a differing affinity for the individual membranes of the eye. Once ulceration of the cornea has been brought about by endogenous means, there is no reason why pathogenic organisms present in the conjunctival sac will not attack the cornea, with its lowered resistance, and bring about a mixed type of infection.

Corneal ulcers caused by focal infection or systemic disease are much more resistant to local treatment than ulcers of ectogenous origin unless their cause is promptly located and promptly removed. The corneal ulcers which are so often seen following smallpox are the most stubborn that we have to deal with, but this type is classed by many with ectogenous ulcers because the corneal involvement takes place after an immunity to smallpox has been established.

Acne rosacea occasionally produces corneal ulceration which responds readily to local treatment but is prone to recur. Recently we have had under observation a case which has had recurrences extending over a period of four years, in spite of treatment in the best skin clinics in America.

The conjunctiva sclera extends over the surface of the cornea and forms an integral part of the cornea itself. The cornea is set like a watch glass in the sclera, the anterior layers of which overlap its margin. The transition of the fibers of the sclera into those of the cornea is very gradual. The layers of the cornea are: (1) Epithelium—stratified pavement epithelium; (2) Bowman's membrane—a structureless membrane of slight elasticity; (3) substantia propria—the parenchyma of the cornea; (4) Descemet's membrane—a structureless membrane forming the posterior boundary of the parenchyma; and (5) a single layer of smooth cells with round nuclei.

Under normal conditions there are no blood vessels in the cornea. The marginal vascular network of the conjunctiva ceases at the limbus. The cornea may gather its nutriment material from three possible sources, either from the network of vessels about the margin, from the aqueous

behind it, or from the lymph spaces within it. It is readily seen that as compared with other tissues of the eye the cornea is more likely to become infected because it is deprived of a direct blood supply. It is also less able to combat infection once infection has taken place, and reparative processes will naturally be retarded.

Because corneal ulcers heal with cicatrization it is of utmost importance to determine the cause as early as possible and lose no time in removing the cause.

I now wish to present briefly the important points in three interesting cases which we have recently had:

Case 1. Mr. A. B., age 38, came February 25, 1926, complaining of pain, redness and sensitiveness to light in left eye. The onset was sudden, the symptoms appearing the day before he came to us. There was a history of two previous attacks of iritis in same eye, extending over a period of several years. Examination showed moderately severe iritis and a small superficial, spreading corneal ulcer situated near the inner sclerocorneal margin. Examination of the teeth showed a mouth full of crowns and bridge-work. He was referred to a dentist, who reported eighteen abscessed teeth; these were extracted. During the interval between the first examination and the extraction of the teeth the ulcer extended and the iritis became more severe, in spite of local treatment; but almost the day following the extraction the eye began to improve, and in one week the patient was discharged as recovered.

Case 2. Mrs. L. R., age 21, seen first April 19, 1916, complaining of pain, redness and sensitiveness to light in left eye, Examination of eye showed small superficial ulcer near outer sclerocorneal margin. Just preceding the eye symptoms a deep abscess appeared on left arm, following an injection of magnesium sulphate given during labor six weeks before. The corneal ulcer healed very promptly under local treatment and drainage of abscessed arm.

Case 3. Mr. T. A. B., age 24, occupation, road overseer. Came April 27, 1926, complaining of pain, redness, and sensitiveness to light of left eye. Examination of eye showed small ulcer near upper sclerocorneal margin, with small pannus. Just preceding the corneal ulcer, the patient developed two large boils or abscesses, one on right thigh and one on right forearm. The ulcer promptly healed with drainage of the abscesses and local treatment of the ulcer with atropin and cauterization.

CHRONIC POLIOENCEPHALITIS SUPERIOR—WITH REPORT OF CASE

S. R. Taylor, M.D., Greensboro.

Chronic polioencephalitis superior, ophthalmoplegia, was first described by Wernicke. It was called polioencephalitis because of its close resemblance in many respects to poliomyelitis. It is characterized by a gradual loss of power in the external and internal muscles of the eyeball. Usually the condition is bilateral. This is not always true, however, for it may be unilateral or may affect only the ocular muscles.

As to etiology, various authors have given a number of causes: infections, toxic conditions, syphilis, alcohol, and heredity. When due to the last named cause the condition is much more rare in occurrence and appears usually during adolescence.

The pathology consists of a lesion or lesions of variable extent involving the nuclei of the third, fourth, and sixth nerves in the wall of the aqueduct of Sylvius between the posterior part of the third and the upper portion of the fourth ventricle. In the early stage there is only hyperemia about the nuclei; later this is replaced by leukocytic infiltration. This is followed by the loss of the prolongations of the cells. Still later, vacuoles and pigmentary degenerations appear. Sometimes capillary hemorrhages are seen, and very rarely there is a thickening of the lining membrane of the aqueduct of Sylvius.

The symptoms and physical findings have been described by Hutchinson, Von Graefe, and Charcot. They are: (1) Drooping of the lids with head held back and straining with the frontalis muscle to overcome the paralyzed lids; (2) immobility of the eyeballs; (3) fixed pupils; (4) a deviation outward of the eyes. The gradual loss of power makes it rather unusual for the patient to complain of diplopia. The general health is often very good.

The course of the disease varies. It may come to a standstill at any stage of the process, remaining quiescent for years and then suddenly, without apparent cause, progressing to a fatal termination. It may come to a standstill and remain so for the remainder of the patient's life.

The diagnosis depends on the gradual loss of power and paralysis without acute symptoms, the absence of headache and pressure symptoms suggestive of intracranial growth, and negative x-ray findings as to possible brain tumors.

The treatment, unless syphilis is the causative factor, is of no avail; and even in those cases where syphilis is the causative factor, it is often of little value.

I now want to present the history and physical findings in a case of chronic polioencephalitis superior, which had in addition several unusual and interesting characteristics.

Patient—Colored boy of fourteen years, first seen March 8, 1924. The boy was sent to us not for the paralytic condition but for an acute exacerbation of a chronic left-sided dacryocystitis. (The parents had never been especially alarmed over the ptosis, since an uncle had had a similar condition for years.) *C. C.*—Pus in the left eye, poor vision, drooping of upper eyelids. *H. P. I.*—Pus in the left eye and swelling of the lids for three days. Three years ago, at the age of eleven years, the upper lids began to droop. This condition gradually grew worse. One year ago, 1923, his eyes gradually reached the point that he could not turn them to the left or right or look up or down without moving the head in the corresponding position. During all this time he has not been sick. Appetite has been good, and he has not complained of feeling ill. He has attended school regularly; his teacher says that he is one of the brightest in his class, and in spite of his handicap he has progressed yearly with his class. *P. M. H.*—The past history is negative except for measles at three years and acute dacryocystitis one year ago. *F. H.*—The father, mother, two brothers and three sisters are living and well. There was one miscarriage, and two children died in infancy of unknown causes. A paternal uncle has had a bilateral ptosis for years.

Physical Examination—The left-sided dacryocystitis will be disregarded until later. *Vision*—O.D., 20/20—1; O.S., 20/30; later 20/20. Examination of the eyes showed bilateral ptosis; paralysis of all the external ocular muscles; constant

divergent squint, the patient fixing with the right eye; there being no diplopia. The corneae were clear. Pupils were normal in size and reacted to light and accommodation, the reaction to light being slightly more sluggish than would be considered normal. The fundus was entirely negative. *Hearing test* showed hearing to be perfectly normal. Nose failed to reveal any pathology or evidence of obstruction. *Mouth and throat*: Teeth in excellent condition. All vital. No cavities. Tonsils, though enlarged and cryptic, showed no pus or caseous material. (General physical examination by Dr. R. N. Harden.)

I shall not detain you with a long account of negative physical findings but only say that except for the above condition he was a perfect specimen, with no evidence of disease. Muscular development was good, with no trace of weakness.

Laboratory Examination: The examination of the blood showed a moderate secondary anemia and a white count of 4400 with 51 per cent lymphocytes. Urinalysis showed marked albuminuria, many pus cells and granular casts. There was no blood. Blood Wassermann was negative on two occasions, once after a provocative dose of salvarsan. The mother's blood was likewise negative. *X-ray* (by Dr. Shohan): X-ray and fluoroscopic examination of the lungs revealed no evidence of tuberculosis or other pathology.

Stereoscopic plates of head showed the accessory sinuses of the nose perfectly clear and free from any disease process.

In the wall of the left maxillary sinus was seen an unerupted supernumerary tooth, occluding the cystic duct on that side and being the predisposing cause of the dacryocystitis.

Under local treatment the dacryocystitis improved markedly. Coincident with this there was a clearing up of the urinary findings until in May, 1924, only a trace of albumin was found.

The interesting points in this case to us were: (1) That heredity might be a causative factor, an uncle having had a similar condition for years. (2) That the supernumerary unerupted tooth in the wall of the maxillary sinus was the predisposing cause of the dacryocystitis, and that the latter evidently was the focus of infection for the acute nephritis. This conclusion seems justified in that, as the acute dacryocystitis improved with treatment, the nephritis cleared up. (3) That the irido-ciliary nucleus was spared in spite of its close anatomical relationship to the remaining nuclei of the third nerve. Just how a disease process could affect all others and spare this one has afforded us no little interest.

REFERENCES

Church and Peterson: Nervous and Mental Diseases, 1925, p. 155.
Starr: Nervous Diseases, 1913, p. 538.
Osler-McCrae: Modern Medicine, 1915, p. 365.

DISCUSSION

Dr. Frank C. Smith, Durham: This is a very interesting case, bringing up nuclear palsy with its difficult problem of etiology. Here we have a complete bilateral exterior palsy, the interior muscles and the levator not being involved. This must be central in origin; for in the aqueduct of Sylvius the nuclei of the interior muscles and for the levator lie at some distance from the nuclei of the other muscles supplied by the third nerve. For this reason a lesion of the trunk would be likely to in-

volve all the muscles supplied by this nerve and would be unilateral unless there was a lesion of each nerve. To determine the etiology is difficult. Any slowly developing lesion (degeneration, chronic inflammation, small tumor, etc.) could have caused all the symptoms described. The impacted tooth recalls a case of jaw-winking reported to have developed following a difficult tooth extraction. In jaw-winking the nuclei are involved and there is a spasm of the levator. It is difficult to see how there could be any connection between the extraction and the perverted function of the nerve fibers. However, in the very few reported cases of acquired jaw-winking, another is reported immediately following trauma.

Dr. Taylor (closing the discussion): Very often we men doing eye, ear, nose, and throat work are called on to make a diagnosis of these things and locate the lesion if possible. I presented the paper with the idea of stimulating more interest in the two specialities which are closely related: namely, ophthalmology and neurology.

MARKED UNILATERAL IMPAIRMENT OF VISION—(DUE TO AN UNUSUAL EXTRA-OCULAR CAUSE)

J. G. Johnston, M.D., Charlotte.

Case Report: J. A. L., age 54, merchant. September, 1925. Has suffered a great deal of pain for the past three months in the right side of his head and right eye, with dimness of vision in the right eye. Has been careful to correct his constipation. Head hurts much worse on use of eyes. Eyes were gone over, finding vision O.D. 20/100 with 1.00; O.S. with 1.00 gave 20/30. As could not improve right vision further and ophthalmoscope showed no reason for dimness of vision, he was advised to return for drops and a more careful study of his eyes. December 9th he came for this, and under homatropin results were not much better. O.D. with + 1.50 D.S. gave 20/70 vision and O.S. with + 1.25 D.S. combined with +0.50 C. axis 180 gave 20/20 vision. Fundus showing nothing to account for poor vision, attention was then turned to the sinuses in an effort to locate the cause. Transillumination showed a dimness of light through the frontals giving the impression of dense bone. The left antrum was fairly clear, while the right was extremely dark. Here let me say that, excepting the pain in his head, he had no indication of sinus trouble, no frequent colds, no trouble breathing through his nose, no nasal discharge. X-ray report: "Very dense clouding of both antra—suggestion of polypi. Both ethmoids also very much clouded. There is lack of development of frontals and sphenoids." Urine showed a decided trace of albumin, 25 pus cells and many blood cells to the field.

On the strength of these reports, especially the x-ray and transillumination, he was advised to have the right antrum opened, in spite of the fact that his white blood count was only 7,600. He went to the hospital, and under local anesthesia the right antrum was opened through the canine fossa. To my surprise the antrum was entirely dry and apparently normal. However, as soon as an opening was made there was a rush of air from the antrum with a foul odor as of the colon bacillus. The nurse assisting at the operation also noticed the foul odor. There being no discharge the antrum was not irrigated, but the wound was kept open with a small amount of sterile gauze. This was kept open for three days and allowed to close. There was never any discharge, and

the foul odor was not noticed at any time after the first opening. One week after the operation he came back for refraction and at this time examination showed O.D. +1.50 D.S. combined with C. axis 180 giving 20/30 vision; O.S.+1.25 D.S. combined with C. axis 180 gave 20/20 vision and +1.75 added to this for reading gave him comfortable vision both for distance and near. He had no pain at all after a couple of hours following the operation. I have not seen him since, but his son was in the office in March, 1926, and reported that his father had had absolutely no trouble since his return home.

Comment: It is no unusual thing for an infected antrum to cause trouble in the eye, with dimness of vision; but this is the first time I have ever found an occluded antrum with no pus, but full of foul air, that had this effect on the eye. On close questioning he remembered having an attack of pain in the right side of his face several years ago that lasted for a number of weeks. It seems to me this must have resulted in the closure of the ostium of the antrum, confining the air in it, which, after becoming foul by long confinement, set up this toxic condition in the eye. This case leads us to consider: (1) Is the condition due to the eye alone, or to some outside cause? (2) If the visual condition is not corrected by glasses look for an outside cause. (3) Refraction often serves as an index of some systemic or other extra-ocular condition, therefore patients should be sent to reputable physicians and not to optometrists or opticians.

DISCUSSION

Dr. E. B. Quillen, Rocky Mount: I should like to ask Dr. Johnston if at the time of operation he found a normal ostium of the sinus, entirely sealed, so that there was no ventilation to the sinus?

Dr. T. C. Kerns, Durham: What was the cause of the x-ray shadow in this case?

Dr. E. A. Livingston, Gibson: About six weeks ago we had a farmer come in because he couldn't see the seed falling out of his planter and couldn't run a plow or do any thing else about the farm. We sent him for refraction, but that did him no good. He was advised to have some of his teeth and his tonsils removed. Within fifteen days after his teeth and tonsils were removed, this same fellow (who previously couldn't tell you how many fingers you held up, or whether you were white or black from a distance of ten feet) could read a two and a half inch sign at a distance of sixty feet. I thought this might mean something to men not doing eye work, but who happen to have as patients people who have to work and who can't see. It was purely a toxic condition.

Dr. R. L. Daniels, New Bern: Some authorities claim that 80 per cent of us have some sinus condition. Dr. Johnston referred to the x-ray showing of shadow, and yet on opening it he was unable to find any pus or any exudate. In my experience I have found a good many that would show with transillumination and x-ray, without any pus or any discharge; it would be a non-exudative inflammation. I started to irrigate these sinuses, and after two or three irrigations the inflammation would be changed into an exudative variety. You can go on and cure those cases very often with irrigation; and x-ray picture will show them clear and transillumination will show them clear.

Dr. Johnston (closing the discussion): To me this was a very interesting case, as it was something I had never run across before. We should be very much better off, I think, if we would examine sinuses more carefully in these eye conditions. As far as I could tell, and also by noticing the man more carefully, I think the ostium to his antrum was closed. In that respect, I can't conceive why, with this extremely foul odor in the antrum, it wouldn't be possible to detect that odor on his breath sometimes; but there was absolutely no bad odor to his breath, so far as I could detect.

ACUTE EAR CONDITIONS IN CHILDREN

E. B. Quillen, M.D., Rocky Mount.

This paper is offered not with the idea of presenting much that is new but with the desire to bring to the attention of ear men the importance of a greater appreciation of the bearing of acute ear conditions in infancy and childhood on the hearing and general well-being of the adult. All of us are constantly struck with the great number of older children and adults who consult us because of a chronic running ear or impaired hearing, or both, with the history of having had trouble since infancy. Serious impairment of hearing in an adult is a great affliction which embitters the patient's whole life. All of his mental processes are changed; he becomes a different person from other people. In the infant it is equivalent to deafness, for the child learns to talk by imitating what it hears; and if it does not plainly understand the speech of those around it, consequently taking no interest in what is going on, there is no impulse to induce an attempt to speak.

Since it is the desire of our profession to promote the happiness and well-being of the race in every way we can, I wish to impress upon the members of our section the importance of constantly striving to keep before the general practitioner the necessity for him to be more on the outlook for acute ear conditions in infancy and childhood and of learning to recognize them early and to see that proper treatment is instituted, thereby conserving hearing and health and adding much to the happiness and usefulness of the individual through his whole life. It may sound ridiculous to state that there are any number of medical men who frankly say they do not know anything about ears and never expect to try to learn, but this is unfortunately true. Every physician should know how to examine an ear drum and to recognize the changes seen in acute middle ear inflammation. Outside of the otologists and the pediatrists, however, very few of them do. This does not apply to the older physicians alone but to the more recent graduates as well, and it is certainly a reflection on the training given in most of our medical schools. I do not wish to offend any general practitioner; but I do want to help him to realize the importance of his acquiring greater knowledge of this subject, so that he may be able to render still better service to his patient. If he does not wish to open an ear drum, all well and good; but he should be in a position to know when it needs doing. No physical examination of a child is complete without an examination of the ears. In speaking of paracentesis of the drum membranes, I take the position that all acutely inflamed drums (except clean-cut cases of myringitis of more than forty-

eight hours' standing), whether the symptoms are severe or not, should be freely incised, if one is so fortunate as to see them that early. We are seeing them earlier than we used to, due to the spread of knowledge of such things among the laity and to the fact that all the profession is realizing more and more the importance of prompt treatment. For that matter, no harm is ever done in properly opening a normal drum. To wait for the drum to rupture spontaneously in many cases means a permanent opening with an intermittently running ear and greatly impaired hearing, with the constant danger of an acute flare-up of the mastoid or cholesteatoma later. When the drum ruptures itself, it is only after there has been an inflammatory process going on in the middle ear for some time with the consequent danger that goes with it, including involvement of the ossicular chain. This perforation is a tear due to pressure necrosis and does not tend to heal. Even if healing does not take place, the process goes on much longer than when a clean-cut surgical opening is made, as these wounds always unite promptly, with a normal appearing drum and good hearing.

Peculiar anatomical conditions of the infantile auditory duct tend to favor the occurrence of otitis media. The tympanic cavity at birth, and for a few weeks after, contains a good deal of mucous tissue and fluid. Both are excellent culture media for bacteria. The eustachian tube is short, wide, and nearly horizontal, with feebly developed muscles, which makes it easy for pharyngeal mucus and other foreign substances to enter the tympanum. Many authors believe that otitis media in infants is caused more by the aspiration of foreign material than it is by the bacteria which are carried in with it. The entrance takes place during deglutition or vomiting, and this is aided by the recumbent position of the nursing child. Suppurations in the middle ear of infants are very common, though rarely fatal. We all see many discharging ears in babies a few weeks of age, with the history of having begun to run when a week or so old. The trouble is usually not suspected by the mother or nurse until the discharge begins, as they usually attribute the restlessness and other slight disturbances to colic or some other cause. When the case is seen by an ear man, if there is the slightest bulging of the drum, it should be punctured at once. It is not always easy to make out the land marks in the membrane of the new-born child, because they are poorly defined. Five years ago I saw a healthy, well developed three-weeks-old infant with a rather large subperiosteal postauricular swelling. The drum looked normal. The child was not uncomfortable or sick, and the mother said it had not been. Opening and draining the abscess and mastoid antrum resulted in healing in ten days, and the child has had a normal ear ever since. These ear suppurations in infants are most apt to occur in premature and weakly children. The tendency to such troubles lessens as the child grows older until it begins to have the acute infectious diseases, which bring about increased activity of the bacteria always present in the nasopharynx. Those children with adenoids and diseased tonsils and paranasal sinus infections are apparently more prone to such troubles than others, although in certain epidemics children who have had a good tonsil and adenoid operation seem to have otitis media about as often as the unoperated ones. One is apt to overlook the symptoms of a purulent otitis media which develops at the crisis of an acute infectious disease,

as the symptoms are hidden by those of the general disease. The ear drums should be regularly inspected in all of the acute infections of childhood. I believe I have seen in babies some cases of otitis media caused by the eruption of teeth. The bacteriology of this disease is too well known to need repetition here, but the pneumococcus and certain of the streptococci are more to be feared than the staphylococcus and influenza bacillus. The pneumococcus is apt to cause rapid destruction of tissues with meningitis as a complication. The staphylococci are apt to cause sinus complications. The same organism frequently causes a different clinical picture in different individuals, depending of course upon the virulence of the bacterium and the resistance of the individual.

The symptoms of acute otitis media vary all the way from mild earache (or no earache at all) with slightly impaired hearing, mild fever, and malaise to the fulminating type ushered in by high temperature, vomiting, unconsciousness and convulsions. The changes in the drum membranes must, of course, vary with the progress of the disease. Early the membrane tensa may appear normal, with a red and somewhat thickened Shrapnell's membrane. This indicates trouble in the vault which will later extend downward into the antrum. Later the whole membrane becomes red, and bulging of the posterior part of the membrana tensa is seen. If not promptly incised the whole drum will soon be seen bulging, with probably a small perforation posteriorly and some pus in the canal. The mastoid antrum is always involved, and there is tenderness over it and usually the tip as well. The white blood count is important if taken at regular intervals. A high count with a percentage of polys above 75 per cent and a correspondingly high temperature is, we believe, rather a good sign than otherwise. After paracentesis, however, we like to see the white count steadily drop.

The treatment is general and local. Small broken doses of calomel seem to do more than merely empty the bowels, and we believe it is always a good start. Prompt incision of the drum membrane extending from below upward into the canal wall should be done. No anesthetic is needed in infants and young children. The patient is to be confined to bed. Locally the treatment in the past has been largely a matter of keeping the ear canal clean rather than using drugs, but for the last year or two we have been using a 20 per cent. solution of mercurochrome 220 in the canal after paracentesis, and we believe that we have had fewer mastoids and that the course of the disease has been shorter. We use some of the bland, oily solutions in the nose as a routine and sometimes a 25 per cent. solution of argyrol for its bacteriostatic and astringent qualities. We have removed adenoids during the disease in two cases only. As a routine measure we doubt the advisability of it.

In closing I would emphasize the importance of our striving to educate the general profession and the laity in the importance of the early recognition of these acute ear conditions in children, for nothing tends to affect the general happiness and usefulness of the individual in later life more than deafness. Let us stress the importance of cleaning up all lymphoid tissue in the throat as both a prophylactic and curative measure, and when the subacute and chronic cases fall into our hands for treatment let us leave nothing undone that may help restore the ear to health.

DISCUSSION

Dr. M. R. Gibson, Raleigh: My experience has been similar to that of Dr. Quillen. I have found in a great number of otitis media cases, where paracentesis has been done thoroughly, the improvement was not noticeable until the tonsils and adenoids had been removed, and that upon removal of the tonsils and adenoids they would get well almost immediately. I have been so much impressed with this fact that if my otitis media cases have not gotten well in the course of a week or ten days, I immediately do a tonsil-adenoid operation. I have been very much impressed with the rapid recovery after this operation.

Dr. S. R. Taylor, Greensboro: I do not agree exactly with everything that the doctor has said. I don't think that you can prescribe any one treatment for these cases and say that you are going to follow that treatment in every case. The way we handle these cases is this: We do not attempt to open every ear drum we see. If a drum is bulging and we can see fluid in it, or pus, we do open it; but there are a good many of these drums (and I am sure you have all seen them) where you are unable to see fluid and where the case is of short duration. In these cases we use a two per cent. solution of cocain, and it has proven satisfactory to shrink the eustachian tube. In my limited experience it has proven satisfactory. In the treatment of chronic running ear we do not attempt to follow any one method. We treat some of them by the wick method and we treat some of them by the wet method, as it is called. Recently we have been using something whose success I can not report, but so far it has been quite satisfactory as far as we can tell. We haven't had enough cases to report any very marked success. It is not original with us at all. We are using now a two per cent. solution of acriviolet in a twenty per cent alcoholic solution, for those cases which present a gram-positive organism; and in those cases where the slide shows a gram-negative organism we use one per cent meroxyl in a two per cent solution of acetic acid. It seems to me to be a pretty sound treatment. Acriviolet solution is a combination of acriflavin and gentian-violet. Some of them have been using gentian-violet, but I believe that the acriviolet solution is better than just the plain gentian-violet. I should like to see it used more extensively.

The treatment of deafness at present is preventive rather than curative, and the more attention we direct to otitis media in children the better will be our results in these cases.

Dr. Quillen (closing the discussion): My paper was intended not so much as a discussion of acute otitis media or any particular method of treatment. It doesn't make any difference what the method of treatment is, provided we do the thing that we have found best and try to improve our knowledge all the time. This paper was presented really more as a plea for the conservation of hearing at the very beginning. As you all know, most of the deafness in adult life is traceable to these acute conditions in infancy or childhood. It is really astounding to note the indifference with which the average physician treats running ear in the children of his clientele, and I think it is a crying shame that they do not make an effort to help those children before it is too late. I think too much stress can not be laid upon this thing. Surely nothing has done more to impair the welfare and happiness of people than poor hearing.

THE GRADINEGO SYMPTOM-COMPLEX: WITH REPORT OF TWO CASES

R. S. Beam, M.D., Lumberton.

Although first described more than twenty years ago and subsequently confirmed by abundant evidence, I have not seen reference to the Gradinego symptom-complex in any modern text book on otolaryngology, and apparently it is neglected in the teachings of our post-graduate medical schools. The triad of symptoms as described by Gradinego are: (1) a purulent otitis media; (2) severe pain referred to the temporal region of the affected side; (3) paralysis of the sixth or abducens nerve on the same side. It was referred to in the 1924 edition of the Year Book of Eye, Ear, Nose and Throat, but I have not seen it in a previous or subsequent edition. A few cases have been reported in American literature, notably those of Perkins, who in his first article (in 1910) had collected 95 cases. In this collection there is but one reference made to the American literature, but since this time cases have been reported by King, Chamberlain, and others. In the writer's practice it has been seen twice in 300 cases of mastoiditis, or 2/3 of one per cent. While the literature that I have seen has not given the percentage of its occurrence, the articles have reported from two to five cases each. This certainly justifies the presumption that its occurrence is not so infrequent as the average otologist believes, but, on the other hand, that it is of sufficient frequency to justify the attention of every eye, ear, nose and throat specialist. Apparently cases occur and recover with or without operation and are not diagnosed, or, if so, not reported. Gradinego considers that the syndrone of clinical symptoms is the result of a circumscribed, simple, serous leptomeningitis, localized about the tip of the pyramid and caused by the diffusion of the infection in the tympanum. The consideration of the clinical picture, he says, leads him to believe that the progress is along the preëxisting anatomical paths. These paths are described by Perkins as follows, though he considers that there may be others: (1) The infection may follow the sublabyrinthine route, extending from the tympanum below the labyrinth and internal auditory meatus to the petrous tip. (2) From the mastoid antrum it may extend through the subarcuate fossa or petromastoid canal, which passes inward beneath the superior semicircular canal, and reach a layer of cells sometimes lying above the internal auditory meatus, and thus arrive at the petrous tip. (3) Or this point may be arrived at by way of the carotid canal, access to which is obtained by eroding the bone on the anterior tympanic wall, or through one of the caroticotympanic foramina, which give passage to the carotid branches of the tympanic plexus. (4) Finally, the infection has been found in some autopsies to be through a layer of cells extending along the eustachian tube, thus passing from the tympanum to the petrous tip."

Acording to Gradinego, the paralysis of the sixth nerve is due to its passage through a minute canal which he calls Dorrello's canal. Swelling or edema of the wall of this canal causes pressure with the resultant paralysis.

The pain is due to involvement of the Gasserian ganglion, which lies in a depression on the anterior surface of the apex of the petrous portion of the temporal bone.

Gradinego considers the complications of the mastoid as associated with a severe otitis media, but otherwise as having no relation to the syndrome. This inference might be justified in the majority of cases, but in at least one of the writer's two cases the route of the infection could be traced from the atticus to the mastoid antrum; and from here a circumscribed area of softened bone (about 6 mm. in diameter) extended inward toward the petrous tip, terminating near the position of the superior semicircular canal. This tract could easily be followed with a curette at the time of a secondary operation, which was done two months after the first one. In this case there was certainly no marked suppurative process in the middle ear at the time the syndrome developed. This patient presented one marked deviation from the syndrome as described by Gradinego, in that the profuse discharge from the middle ear was not present. The only evidence of a discharge was a slight moisture deep in the canal, which the patient did not know was present at the time of her first visit to my office.

Wheeler says: "The paralysis may clear up in a few days, and in a few cases has disappeared almost miraculously after mastoid operation. Usually it persists for weeks and months, and there is a possibility of permanent impairment to the nerve. Although Gradinego's syndrome may indicate a deep-seated process, this in itself does not justify mastoid operation in every case, for recovery has occurred in a number of cases without mastoid operation and even without myringotomy."

That we are dealing with a pneumatic petrous bone in the Gradinego symptom-complex, and pus formation at the tip, seems to be the opinion of most writers. This is undoubtedly true in many cases; however, the fact that many cases recover without operation and about 90 per cent. of the others after mastoid operation leaves some doubt in my mind that this condition exists in all cases. Certainly this was not the case in one of the writer's cases. If so there could not possibly have been a breaking down and pus formation at the petrous tip. With a pneumatic petrous bone the possibility of a breaking down process and localized abscess would be greater than if the air cells did not exist, and it goes without saying that this area can not be drained by a simple mastoid operation. In the writer's opinion the presence of pus or a localized abscess at the tip is not necessary for the syndrome, and to my mind this is borne out by the early and almost miraculous recoveries that have followed mastoid operation. The success of a mastoid operation will probably depend on the route the infection has taken from the middle ear and whether or not there is a localized area of pus at the tip of the petrous bone. Since it is not always possible to determine this, I wish to subscribe to the opinion that early and thorough mastoid operation should be done in every case, even though the symptoms and signs referable to the mastoid alone do not justify the operation.

I wish to report the following cases of Gradinego's symptom-complex at this time:

The first case I am reporting from my incomplete office record and from memory, as the complete record on this case was destroyed in the Thompson Hospital fire in 1924:

Case No. 1. R. L. B., age 24, referred to me October 18, 1920: Chief complaint was pain over right mastoid, with profuse discharge from right ear. The pain back of ear had come on three days previous, but the discharge followed spontaneous rupture of an otitis media complicating a mild attack of influenza three weeks previous. On examination the left drum was found to be normal; the right canal was filled with a profuse discharge; the drum was red and bulging, with a medium-sized perforation posterior to the long handle of the malleus. The posterior superior canal wall was drooping. There was pain and tenderness over the entire mastoid bone. The patient was pale, faintish, and had the appearance of one being rather seriously ill; temperature 101, pulse 110.

He was admitted to the Thompson Hospital and the next morning a simple mastoid operation was performed. The entire mastoid process was found to be softened and the cells filled with thick heavy pus. The mucosa of the air cells showed extreme thickening. The cells were fairly numerous, extending deep into the tip and far up into the zygomatic process but appeared to be within the bounds of what might be considered an average in this respect. On the third day following the operation the dressing was changed. There was profuse discharge from the canal and a moderate discharge from the mastoid wound. Following this the dressing was changed from one to two times daily. The discharge became more profuse, both from the canal and mastoid wound, the dressing in only a few hours becoming entirely saturated with thick heavy pus. On the fifth day he complained of pain in the right temporal region, which became more and more severe, but could usually be controlled with aspirin. On the eighth day he complained of double vision, which progressed to a complete paralysis of the external rectus muscle on the right side by the twelfth day. Temperature fluctuated from subnormal in the mornings to 101° and occasionally 102° in the afternoon. Pain was continuous, and occasionally it was necessary to give narcotics. This condition continued without improvement, and on the twentieth day the wound was opened and the entire cavity curetted and searched for softened bone and remaining air cells. At this operation a few air cells containing pus were found extending well up into the zygoma. The patient made no improvement, but took on a septic appearance and apparently lost interest in everything. He was never able to be out of bed at any time. Blood culture was negative. My office records do not show the result of white cell count, but I recall that it showed a moderate leukocytosis. Not having seen or heard of a case of Gradinego's syndrome at this time, I was unable to recognize the condition and was at a loss to know just what to do. About thirty days after the second operation (I have no record to show the exact date) the wound was opened for the third time. At this operation the curettage was much more radical than at the previous ones, extending deep into the zygoma and as far in the petrous body as I dared to go. The bone in all directions was very soft and friable. An occasional small air cell containing pus was found in the zygoma and deep in the tip. Following this operation the patient made a rapid recovery and left the hospital at the end of five weeks. The temporal pain, abducens palsy and diplopia had entirely disappeared, the mastoid wound had closed, and the ear was dry.

Case 2. M. T. Female, 19 years of age, referred to me February 18th of this year. Chief complaint, severe pain in right temporal region and in and

around right eye. There had been a mild attack of influenza, or more probably a severe head cold, six weeks previous, followed by an otitis media and rupture of the ear drum. Discharge had been very slight and there had been some slight pain back of the ear. Ten days previous to visit to my office she developed pain in the right temporal region. She had been treated by a very reputable specialist, who had advised mastoid operation. On examination, the left ear drum was negative; hearing, 20/20; the right canal contained a small amount of mucopurulent discharge, mostly mucus. The lower portion of the drum was slightly purplish and retracted. Above there was a small bit of granulation tissue projecting through an opening in Shrapnell's membrane. There was moderate drooping of the posterior superior canal wall and slight tenderness over mastoid antrum; hearing, 15/20. Eyes: vision O. D. 20/20, O. S. 20/20, muscle balance normal, fundi negative; slightly sensitive to light; and examination aggravated temporal pain. Temperature normal; pulse normal. She was admitted to the Baker Sanatorium. The following morning a simple mastoid operation was performed. The outer plate was found to be very thick and hard; the first air cells opened were small and apparently normal, and it was not until the antrum was opened that any pathology was found; the walls were softened, and the cavity was partially filled with a mucopurulent accumulation; the mucosa was extremely thickened. From here a layer of cells containing pus extended posteriorly for some distance, also well up into the xygoma. The cell structure was soft but had not broken down. All diseased bone that could be found was removed, the cavity was packed with sterile gauze drains, and a single silkworm-gut suture placed in the upper angle.

On the following day the patient's temperature and pulse were normal, though the temporal pain was more severe, necessitating narcotics. At the first dressing on the third day the canal was dry and there was only slight serosanguineous discharge from the mastoid wound. The wound looked good, and there was no inflammatory reaction in the soft tissue. At this time the patient complained of slight diplopia and the temporal pain had become so severe that the room had to be kept dark and narcotics administered. The patient was extremely nervous, could not sleep and cried continuously. The dressing was changed daily; the canal remained dry; and there was never more than a slight discharge from the mastoid wound, which was more mucus than pus. All this time the diplopia was becoming progressively worse, until by the tenth day there was complete paralysis of the external rectus muscle. The wound appeared to be healing nicely, but on account of the abducens palsy and severe temporal pain, the lower angle of the wound was kept open and the drain inserted daily to the bottom of the cavity. By the twentieth day there was practically no drainage from the mastoid wound, and the drain was left out. From this time on the dressing was changed every second day, and the only drainage to be seen would be a small moist spot on the gauze about the size of a dime, apparently mucus. The patient was discharged on the thirtieth day. At this time she showed about fifteen degrees external rotation; and the mastoid wound had closed except for a three mm. skin opening, which apparently led to the bottom of the excavation in the upper angle. The temporal pain was slightly less severe.

On account of the distance to Lumberton she was instructed to go to her physician every second day for dressing and observation and return to my office weekly. During her stay at home she was given salicylates routinely, but on several occasions it was necessary for her physician to administer nar-

cotics. On her first visit back to my office, her condition was found to be about the same as it was at the time of her discharge from the hospital; and this condition continued until her second admission on April 8th of this year.

On April 9th the old wound was reopened and the fistula was followed to a small circumscribed area of slightly necrotic and softened bone leading inward, beneath and deep into the zygoma. A few air cells with thickened mucosa were found in the zygoma, but none in the tip. On the day following the operation, the patient's temperature and pulse were normal, but the temporal pain was worse and she complained of dizziness and a sensation of turning over. On the third day at the first dressing the wound was clean and the drain left out. Healing took place by first intention, and by the tenth day the pain and abducens palsy had entirely disappeared. Up until the eighth day the patient had not raised her head from the pillow on account of the dizziness, but from this time on this symptom rapidly cleared up. During her stay at the hospital her temperature was never above normal. She was discharged cured on the fourteenth day.

THE CONTROL OF HEMORRHAGE IN TONSILLECTOMY

W. P. Speas, M.D., Hickory

All surgeons who remove tonsils, regardless of the methods employed, are confronted from time to time with hemorrhage which is controlled only by active measures. The surgeon who is able to say that he has never had a troublesome hemorrhage in a long series of tonsillectomies is to be congratulated, but should be warned that his time will come sooner or later if he continues in the work. This being true, it behooves the tonsil surgeon to be prepared, for he knows neither the minute nor the hour when all his wits and equipment may be called into action to control this most distressing condition.

Treatment for tonsil hemorrhage may be divided for discussion into preventive and active. Preventive treatment may be further divided into general and local.

When a patient comes in for operation a careful physical examination should be made. The writer has observed that patients with a high blood-pressure bleed more freely than those with normal pressure. One should exercise caution in going into these cases. The adult female should not be operated upon either during or immediately preceding the monthly period. (Mrs. S., age 25, came in for operation. Coagulation time was not ascertained. On being questioned relative to her menses, she stated that it was two weeks till her time. After operation she bled for three days, during which time none of us got much sleep. On the third day she became unwell, and all hemorrhage from the throat ceased. She then stated that her sickness usually came on about two weeks before her time.) It is always well to ascertain the patient's coagulation time. The writer is aware that some of our best throat surgeons do not do this. Still, if we would always take the precaution to make this test, we would occasionally save ourselves and our patients much trouble. Various drugs and serums have been recommended, but the writer has had no experience to justify him in making a positive statement in regard to any of them. Calcium chlorid has seemed on some occasions to reduce the clotting time, though this

may have been due to faulty technic. Local preventive measures consist in the use of adrenalin chlorid in local cases and in careful dissection. As a local anesthetic, two per cent. novacain, to which a few drops of adrenalin chlorid solution have been added, is used.

The technic of the operation has a great deal to do with the amount of hemorrhage. Various instruments have been devised for removing the tonsils with a minimum amount of hemorrhage. The writer prefers the dissection and snare method for the simple reason that it is applicable to all cases. A sharp instrument is used to make the initial incision of the mucous membrane around the margin, and a semisharp instrument is used to complete the dissection. Care is exercised to keep close to the capsule. In fact, in many cases where the tonsil is not adherent, the capsule is easily split, so that after the tonsil is removed a layer of the capsule lines the tonsil fossa. If, after removal of the tonsil, the muscles are left traumatized and uncovered by a fibrous layer, the dissection has been too deep. When dissection has been completed down to the base, a snare of No. 9 wire is used to complete the operation. If as much time is used in coming down on the snare as is required in the so-called "bloodless" instruments, the amount of bleeding will be just about as small.

No patient should be put to bed till all bleeding has been controlled. It was the custom of the writer in former days to remove the tonsils and put the patient to bed with a prayer that all bleeding would cease spontaneously. Very naturally, when this is done, the percentage of secondary hemorrhage is high; for most secondary hemorrhage is really primary hemorrhage which has never been controlled.

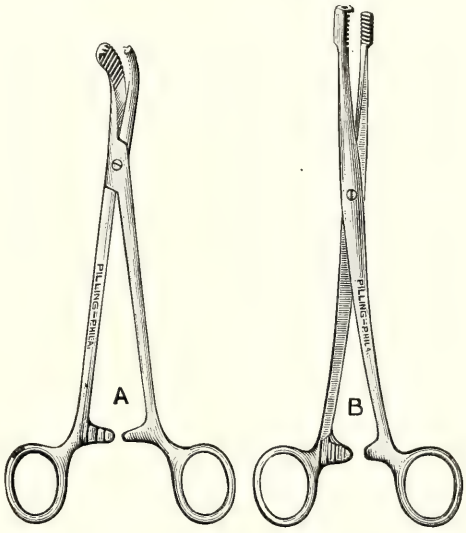
The use of pressure with gauze is not worth much in controlling hemorrhage. It is just as likely to dislodge any clots that may be forming in the small severed blood vessels as it is to encourage this formation. In a series of five hundred cases the sponge with pressure was used in but one case, and in that case it was necessary to tie off the bleeding vessel before the hemorrhage was controlled.

All hemorrhage following tonsillectomy may be divided into two classes: That which oozes from the surface of the tonsil fossa, without any discernible bleeding point that may be tied off; and that which comes from vessels of sufficient size to be tied off. The former class is rare, especially in patients with a normal coagulation time. But it does sometimes occur and requires active interference. Where these weeping surfaces are not too extensive they may be carefully touched with crude carbolic acid, which acts well. If it is due to deficient clotting properties of the blood, horse serum, coagulen-ciba or parent serum may be used. It is sometimes necessary to suture the pillars over gauze. It should be remembered that this procedure increases the liability to infection and is permissible only in rare cases.

Most bleeding following tonsillectomy requiring active treatment comes from a macroscopic vessel. The only right way to stop hemorrhage of this kind is to tie off the vessel. A surgeon undertaking to do any amputation or an abdominal operation of any kind without hemostats would be considered very foolish; and the surgeon removing tonsils without the equipment to tie off a bleeding vessel at any point in

the tonsil fossa is leaning heavily on the goodness of Providence. All surgeons now recognize this fact, as they did not do in the earlier days of tonsil surgery.

So the question resolves itself into a matter of technic. Some of our best surgeons use an ordinary hemostat and needle armed with silk or linen. This has at least two disadvantages. One may puncture a blood vessel in the deeper tissues; and, also, the linen or silk suture, being more permanent, is more likely to produce an abscess. It also requires that the surgeon tie in the throat with the fingers, which most of us find difficult. It has the advantage, however, of staying wherever it is placed. Other experienced throat surgeons are able to tie easily with catgut around an ordinary tonsil hemostat, which method can not be improved upon for the one who is able to do it. Many of us, however, find this a difficult procedure. The writer of this paper belongs to this latter class. Too often, instead of securing with



the suture the tissues in the grasp of the hemostat, the distal ends of the instrument are caught in the tie; and when the hemostat is removed, the suture also comes out tied around its end. To overcome this difficulty the writer has devised a set which he has found to be satisfactory. This set consists of two instruments, "A" and "B." (See cut.) "A" is like any other tonsil hemostat except that one blade of the instrument is broad and blunt like a Jackson forceps. "B" is used to carry the suture down over the hemostat. It is constructed with an eye at the distal end of the instrument, which aids somewhat in carrying down the suture to the proper place. No. 2 catgut is used. To place a suture at any point in the tonsil fossa, it is necessary only to have the patient under reasonable control. Where there is secondary hemorrhage in children it is necessary that they be given ether again, while adult cases do not require this. It goes without saying that a patient should

never be allowed to go out till all danger of bleeding has passed. About three hours after operation the throat should be inspected. If there are clots in the fossa they should be removed. Under a clot there is usually a bleeding vessel, which should be controlled by ligature.

A small amount of hemorrhage is not detrimental to the patient. In fact it is sometimes beneficial, especially where a local anesthetic is used. But beyond this, the welfare of the patient demands that all bleeding be promptly controlled. The loss of much blood means a slow convalescence.

DISCUSSION

Dr. R. S. Beam, Lumberton: The question of controlling hemorrhage in tonsillectomies is a very important one, because this is one of the most frequent operations performed by nose and throat men. It is often easier to prevent hemorrhage than to control it after it has occurred. In this connection I wish to refer to one point that the doctor did not mention. This is the question of blood pressure. In all cases with a blood pressure above normal I ligate all bleeders of any size but do not in any other class of patients. Two days ago, I operated on a young man twenty-seven years of age, and on the same day I operated on a lady sixty years of age. The young man had a rather profuse hemorrhage; the lady had none. I took the lady's blood-pressure, because she was sixty years of age, and she had 120 systolic. After I found the young man bleeding, I found that his pressure was 180. I had taken the wrong person's blood-pressure. I make it a rule to take the blood-pressure in all tonsil cases in patients beyond, say, thirty-five years of age. In persons younger than that I don't bother taking the blood-pressure, though of course I do it if I get a history of high blood pressure.

In doing tonsillectomy, if all the tonsil is removed and nothing but the tonsil, you are not going to have very much hemorrhage; and I am opposed to putting in sutures if it can possibly be avoided, though it is occasionally necessary. The hemorrhage that I have most trouble with, when I have hemorrhage, is secondary hemorrhage that comes on a week or ten days afterwards; and if you put in sutures at the time of your operation you are more likely to have secondary hemorrhage than if you do not. That is, anything you do to traumatize the tissues brings about the greatest amount of slough and is more likely to produce hemorrhage.

In 5,000 tonsillectomies (in all of which I think operation was indicated; none were done on general principles, which I am very much opposed to doing) I have seen very little hemorrhage; but I have always made it a rule to get the field dry before the patient goes off the operating table, by sponging and using tissue clamps. I have found that the most convenient instrument is one that the general surgeon uses. It is a long hemostat, curved almost to a right angle at the tip. I pick up the bleeding point with a straight pair of hemostats and then take a pretty good bite on it with the curved hemostat, press it for a few moments and then get the fossa entirely dry by sponging. Don't let your patient go off the table until the throat is entirely dry, and

the chances of hemorrhage will not be so great. But when you have secondary hemorrhage seven to ten days later, then you are up against a proposition; and I wish somebody would tell me how to avoid it.

Dr. James M. Parrott, Kinston: Our attitude toward tonsillar hemorrhage at the time of operation has been a matter of evolution. About twelve or fifteen years ago I was as frightened in connection with tonsillar hemorrhage as anybody, not because I had had any unusual trouble with this except one time (an infinitesimal proportion to the number operated) but because somebody else said that he had heard of a man who had had trouble with it, and that scared me.

I am not saying there is no danger in tonsillar hemorrhage. There is a considerable amount of danger in tonsillar hemorrhage if not handled skillfully, but I very strongly suspect that most of the deaths from so-called tonsillar hemorrhage have not been due to hemorrhage but to something else. Once in a very, *very* large number of cases secondary hemorrhage may be severe and even alarming. I have seen one or maybe two bleed white from tonsillar hemorrhage, when I thought it was time to do something—and I did do something. But I think we overestimate the danger. A man might cross the main thoroughfare in Wilmington (or Rocky Mount—that is a busy place) two dozen times and encounter more danger than he would in taking out tonsils from one child. That is what I am trying to get over.

The question of controlling hemorrhage in tonsil work is largely an individual equation, I think. I congratulate Dr. Speas on his paper. He is a bright and splendid young man, and I don't want him to feel that I am unkindly criticizing his instrument or his paper. I do not, however, see the necessity for this instrument in my own work. I like simplicity; I like to use just one thing until I learn to use that well. I am like Dr. Chisholm in that respect. Somebody once asked him, "What is the safest anesthetic, ether or chloroform?" The matter was a subject of much debate at the time. Every one south of the Mason-Dixon line was considered guilty of treason if he said "ether", and every fellow north of it was considered guilty of the same offense if he said "chloroform." Dr. Chisholm very wisely replied, "The anesthetic which you use the most and know most about is the safest." In other words, adopt one technic, learn it perfectly, and then use it all the time.

To a man just beginning I would say that your instrument is excellent, Doctor, and I would recommend it to him, because he would have to learn something and he might as well learn that as any other thing. But my idea is, in handling tonsillar hemorrhage, to use the thing that you know best how to use and use it quickly, because whenever you are compelled to use it you have to do it in a minute or two, not in an hour.

My own experience is that when I have blood flowing out, I know just where that is coming from. I know that I have gone a little bit outside the capsule of the tonsil and started the hemorrhage myself; I have probably "bitten in" the peritonsillar tissue with my snare—I am still old-fashioned enough to use snares, you know. When I notice a steady flow of blood I know it comes from the peritonsillar venous plexus, and I just slip on a pair of artery forceps (because I know how to use the artery forceps), and then I go ahead and take out the other

tonsil. Then I do the same thing over there; I get hold of the bleeding point. I urge that suturing and much traumatism be avoided when possible.

To sum up, I think the doctor has a very ingenious instrument, but the best instrument for us to use is the one we know how best to use.

Dr. E. A. Livingston, Gibson: This all sounds very nice about picking up the bleeding point in a tonsil fossa, but it isn't always so easy. We have the hemorrhage that comes immediately after the operation; then we have the one that comes a week later. The man who performed the operation is perhaps a hundred miles away and the patient bleeds profusely. The thing I want to know is what to do for those patients. In my opinion, the best thing to do is to have a glass with a little peroxid in it and a good-sized mop on the end of a sponge-forceps. Go in and tear out the clot, and then pack the fossa for five minutes. Very frequently that will contract the end of the bleeding vessels, and it will never bleed again. If that doesn't stop it, make another tonsil out of gauze, saturate it with a two per cent solution of mercurochrome, pack the gauze into the tonsil fossa and suture the pillars over it. That will almost always stop it. In fact, I have never had a case in which that didn't stop it. In my opinion, that is one of the best ways to stop hemorrhage where you can not get hold of the bleeding point and tie it off: make your tonsil, a snugly fitting one, pack it in between the pillars, and then put one or two sutures over it.

Dr. M. R. Gibson, Raleigh: I am sorry Dr. Speas hasn't his instrument here, for I am sure any one who does have trouble tying off bleeding points in a tonsil fossa would learn to do it with more ease with this instrument than with any other I have ever seen. There is no reason at all for your not getting your suture well over your hemostat. This instrument is a hemostat. It is just a little different from the model we are accustomed to using. I am very much impressed with it and am quite sure it can be used with a great deal of ease.

Dr. J. G. Murphy, Wilmington: I did not intend to say anything on this subject, but I notice the subject of the paper under discussion is the control of hemorrhage after tonsillectomy; and the discussions have been on picking up and tying off. I believe everyone who has gotten up so far has discussed that, and I feel it is time for us to stop discussing the control of hemorrhage following tonsillectomy by a single method only. I have been at this work for some eighteen years; and the longer I practice it, the more convinced I am of the fact that meddlesome interference accounts for more than fifty per cent of the post-tonsillar hemorrhages. Dr. Speas in his paper said that a little bleeding does no harm. That is true. He was then coming toward what I hoped to emphasize in my remarks. Dr. Parrott said that pressure is good. Now, I want to emphasize what Dr. Parrott has said about pressure. The tonsillar operation is just surgery, general surgery applied to that field. The general surgeon lets a thing bleed unless it is a spurter. If it is a spurter, it has to be tied off. But a good deal of this bleeding, even where there is spurting, is never tied by me; and I get results. I get results, if it will not respond to pressure, by clamping. It is seldom that I tie off one. I don't mean to imply that I don't have to tie off, because anybody who does much tonsil work occasionally

is going to have hemorrhages that will require picking up and tying off and a second anesthetic; and you have the deuce of a time very often in those if you don't give an anesthetic. But the longer I do this work, the more impressed I am with the importance of not being too erratic. They call you up about a tonsil operation, and you say: "Send the patient to the hospital, and I will give him an anesthetic and tie it off." That is not conservative practice. Conservative practice is first trying to stop that hemorrhage.

I operated some time ago on a nurse with high blood-pressure. Her coagulation time was only five minutes. I might say, in passing, that we take the coagulation time of all patients. I believe that is an absolute necessity; I don't believe we should take out tonsils without doing that. When Dr. Emil Mayer recommended that to the American Academy of Ophthalmology and Otolaryngology about eight years ago, he hardly got recognition from that body. There were only one or two that were doing it, possibly four or five, in that body of one hundred or one hundred and fifty men. I believe that to-day the majority of the men in this room are doing that. I believe that every man in this room should take the coagulation time of every patient he operates on. That is an absolute, hard and fast, fixed rule with us.

What I want to get over to you, if I can, is not to send all these patients to the hospital and put them through that systemic knock-out that an anesthetic gives them when a little patient waiting, a little pressure, possibly a little adrenalin on a cotton sponge, even if it is a spurter, will often stop these annoying hemorrhages. I don't mean to offer that as a panacea, but let's not tie them off until we have given nature, which is a better doctor than any of us, an opportunity to get in its work and let a clot appear which a little pressure will enable you to secure. Put an artery clamp on the bleeding vessel and wait a short while, then lock the clamp tighter and wait again; then, when you take it off, in eighty to ninety per cent. of the cases your hemorrhage is controlled. The remaining ten to twenty per cent. can be picked up and tied off. To those who say they tie all of them, let me ask that you give this only a trial; and if you are not convinced you are getting results, let Ephraim rejoin himself to his idols.

Dr. E. B. Quillen, Rocky Mount: I think at the outset the important thing for us all to remember and to get into the heads of the laity is that tonsillectomy is never a minor operation; it is never an emergency operation; and no patient should be operated on for the removal of the tonsils without first being carefully gone over by a competent internist. The clotting time or the bleeding time should be taken in every case. You will operate on some with a two-and-a-half-minute clotting time and get a tremendous hemorrhage, maybe with a good operation at that, one of the best you have ever done. But it ought to be taken, in case anything serious happens—and that sometimes does happen. For the last three years, we have taken the clotting and bleeding time in every case. We put them all on rather large doses of calcium for three days, when it is possible to get them that early; and we have certainly had less hemorrhage than we were formerly having.

I don't mean to discredit Dr. Speas' instruments at all, but we don't all have them. Surgery in the throat is simply, as Dr. Murphy said, general surgery applied to a special part of the anatomy; and any man who can't pick up and tie a vessel in the throat with an ordinary hemostat can't pick up and tie a vessel in any other cavity of the body.

I don't agree with Dr. Murphy in some of his statements. I believe if you have a spurter at the time you are operating, if pressure for a very short time doesn't control it, you should pick it up and put a ligature around it. Then you will know that it isn't going to bother you any further.

Dr. Murphy: Clamp fifty per cent. of the cases and you won't need a ligature.

Dr. Quillen: Yes, but you can put a ligature around while waiting for the clamp to control.

I think it is very unfortunate that the impression has gotten abroad that tonsillectomy is a minor operation. It isn't. It is just as much major surgery as removal of the appendix or any other abdominal operation.

Dr. H. C. Willis, Wilson: I can not quite agree with Dr. Parrott that we should not be frightened at these tonsillar hemorrhages, for you get frightened at anything that will bleed. I don't know just how to analyze a man who does not, because a tonsil case can bleed to death if it isn't stopped. If you don't believe it, let one go.

Personally, I don't believe in going into the fossa after you take the tonsil out. I am afraid of traumatization. I believe you will get a great deal of muscle-oozing that you would not get if you stayed out of that fossa. If you go in there and mess around you are not doing surgery, and you ought not to be trying. If you take out one tonsil and see that spurting, you can tell whether it is a spurter or just a venous bleeding. If the thing is spurting there is no use monkeying; go ahead and put a ligature around it. Catgut is much better than silk, for the reason that some men have brought out; it does not cut the fiber and is not so prone to infect. Whenever you have a case where there is a clot formation in that fossa you are flirting with danger if you don't remove the clot immediately, because it keeps the mouth of the blood vessel open as long as it is in the fossa. I believe in practically every case where it is a venous bleeding a little pressure on gauze, not cotton, will stop it. It may take three or four minutes to do it. If you can stop it without a suture it is preferable to do that, because every time you put a suture around those fibers you cause scar tissue. That means more contraction, and that is why you get a lop-sided throat.

The only case that I have ever had give me any concern was in the last four weeks. Two weeks after the operation was performed, the wound healed and smoothed over. The young lady had gone back to work. While she was at work her throat began to bleed. There was no ulcer there; there was nothing at all that you could see except a few little pinholes in the fossa. The tissue was smoothed over all around them. But I want to tell you I had to work mighty hard to stop that bleeding. I tried Dr. Murphy's plan; I tried it at the house. I never

did it before, and I shall never do it again. If I have another such case I am going to give it ether; then I can go in there and tie it off. I'll bet I went to see her a hundred times in a week. When I got one stopped, the other side started up the same way. I wish somebody would tell me what that condition was. I don't know.

Dr. John B. Wright: If you had given her horse-serum, you wouldn't have had to go to her house so often.

Dr. Willis: I'm not so sure about that. Anyway, I stopped it by using hemoplastin, and then finally I had to give an anesthetic and suture both pillars. Mind you, she showed a three-minute clotting time, and at the time of the operation she didn't bleed a teaspoonful. She was twenty-one years of age and showed a blood pressure of 122.

Dr. R. S. Beam, Lumberton: I can't get any results from horse-serum.

Dr. R. L. Daniels, New Bern: I shall have to agree with Dr. Parrott to a certain extent. I think tonsillar hemorrhage is more distressing than it is dangerous (I mean to the patient), and the story that goes out from the parents of patients that "So-and-so had a hemorrhage and pretty nearly died," reflects on the operator. It is distressing to the doctor from that standpoint and distressing to the parents.

Nature has so constructed the human machine that as the loss of blood increases the clotting element of the blood also increases. I have had a good many bleed white. They bleed regardless of what you give. I have operated on a good many children in clinics who were just about as yellow as that paint. They didn't have their clotting time taken, but you know in that type usually the clotting time is very short. When I operated on those patients, they would be just as dry or drier than the robust, red-faced fellow, and, of course, they all had hemorrhage. I use anything that will stop the hemorrhage, any method that is the easiest; and I stop it largely from the standpoint that it is distressing. If the parents of a patient see him expectorate one tablespoonful of blood they think it is a hemorrhage. Recently, my practice has been to pick up the blood vessel with a small clamp and clamp that vessel with a very strong, ordinary tonsil clamp. As a rule that stops it. I don't believe I have had to tie one in a year.

Dr. John B. Wright, Raleigh: I am somewhat surprised to hear my friend Dr. Beam make the statement that horse-serum has no effect in his bleeding cases. It has been my experience in at least a dozen cases in the last two years to operate on what were known to be hemophiliacs. I first gave doses of horse-serum and then operated on them six hours afterward.

With regard to hemorrhage, as Dr. Willis has said, it is an extremely interesting subject. While most of us take the coagulation time of the blood, we do it as a sort of routine matter; we don't do it because we really think it is beneficial or because it is going to give us any information. It is a known fact that people with a short coagulation time very often are free bleeders after the operation, and *vice versa*. I have in my own experience found that when the hemoglo-

bin count is low the bleeding is usually more profuse. If I had to rely on one or the other, I would much prefer relying on the hemoglobin test than on the coagulation time.

In regard to the hemorrhage that occurs at the time of operation, let me make a suggestion to those who have been demonstrating the various methods of controlling it: Turn your back on your patient, walk off, and give nature a few minutes' time. If you stay out of the fossa the majority of them will stop, even the spurters. At least give a few minutes' time for nature alone, unmolested by any application, pressure, or anything else, to enter the fossa itself. Then, if the bleeding persists, the easiest, the quickest, and the best thing to do is to put a ligature around it.

Dr. O. C. Daniels, Chairman: I absolutely agree with Dr. Wright on horse-serum or hemostatic serum. Personally, I have tried just one case in my experience. In connection with the hemorrhage that comes on a week after the operation, I use pressure principally. Pressure will usually stop it. If it doesn't, you can inject (right where the tonsillar hemorrhage is) a solution of novocain with adrenalin, or hemostatic serum. Personally, that kind of hemorrhage has never given me any trouble, because I did not do much for it.

Dr. Speas (closing the discussion): There are just a few things that I think I should say. In the first place, I didn't pass these cuts around to try to sell this instrument to you or to get anybody to use it but to enable you to understand the references to it in my paper. I am not trying to sell the instrument; I am using it myself, and I just wanted you to see it. But if there is anyone here who has had the experience that I used to have in tying around an ordinary hemostat at any point in a tonsillar fossa, I believe he might learn to do it with this instrument to much better advantage. At any rate, every man who does throat surgery should be in a position at all times to tie off the bleeding points. A man who cannot use a hemostat in the throat should not try to do tonsil surgery, and if he can not use an ordinary hemostat he ought to get one that he can use. I mean he ought to do what I did; I made one that I could use. If he can devise one that is better than mine, that is all right; that is the instrument for him to use. A man should use whatever instrument he becomes accustomed to.

As for these spurters that you have at the time of operation, ninety-nine times out of one hundred they will stop if you will leave them alone. If you put your patient to bed with a dry throat, and after a while your nurse comes in and tells you that the patient is bleeding, you had better go back and tie off that blood vessel. I have come to that conclusion from my experience. You had better go back and tie it off if it comes on secondarily, because it will become worse; and the sooner you stop it, the sooner you and the patient will get some rest. As far as technic goes, as I stated in my paper, we keep close to the tonsil; but there are some cases in which you can scarcely tell where the tonsil stops and the other tissues begin, on account of former inflammation and adhesion. In those cases I don't believe there is anybody who can always leave a pretty throat—one that will look pretty two years afterwards. We do

have to tie off more in cases where adhesions have formed. Catgut is the thing to use, even though they may come back a week later and say they have been spitting out catgut ever since they went home.

I have had but little experience with cases that begin to bleed a week or two after operation. I do not know the history of the case that Dr. Willis spoke of, but there is a possibility there of vicarious menstruation. That occurred to me, although he will possibly be able to tell us it was not that.

PARANASAL SINUS DISEASE IN INFANTS AND YOUNG CHILDREN

M. S. Broun, M.D., Asheville

Ten years ago the field of paranasal affections in infants and young children was an unexplored region. Very little was known about the existence of the sinuses and still less about the infections they might harbor. Because of the failure to locate a site of infection in many conditions in which it was certain there was a definite focus, clinicians began the study of the nasal sinuses. Great strides in this field have been made during the past few years, and what we now know about these conditions is due in large measure to such pioneers and investigators as Dean, Sluder, Mosher, Coffin, Skillern, Mitchell, Shea, Marriott, and Arbuckle. Just two years ago Dr. Dean made the statement: "The paranasal sinuses are present in infants and young children; the sinuses may be precocious and may harbor a latent infection." Dr. Jeans strengthened this assertion by the statement: "Any condition in infants and young children that may result from a focus of infection may result from sinus disease". Among such conditions he mentions cardiopathies, rheumatic fever, chorea, nephritis, pyelitis, certain cases of cyclic vomiting, deforming periarthritis, anemia, anorexia, malnutrition, and chronic digestive disturbances. It would appear from the above list that the eradication of this trouble would be the panacea for all the ills the human flesh falls heir to. There is no doubt, however, that the paranasal sinuses and their affections are often directly responsible for many of the ills of infants and young children.

Returning, however, to the subject immediately before us. To know the pathological one must be familiar with the normal. This statement could never be more true than in the affections now under consideration. Any thorough consideration of the paranasal sinus affections in children must include at the beginning a definite knowledge of the anatomy of the parts involved, and where this anatomy differs from that of the adult.

It has been stated above that the ethmoid cells are always present at birth. At this time they are merely blind tubular sacs with their ostia communicating with the nasal fossa. They necessarily must become involved in all infections and conditions that involve the nasal cavities. The size of either group is normally 5 by 4 by 2 mm. They are originally solid structures but soon become honeycombed, and growth is in almost any direction. The posterior group wander greatly and pneumatize into the supra- and infra-orbital plate of the maxilla and into the sphenoid bone and palate bone. Growth is rapid until puberty.

The progress of this growth, however, is very materially influenced by the infections to which the cells are subjected and from which they suffer. Disease in early life will undoubtedly prevent this growth and thus determine the future development of the sinuses, sometimes preventing the formation of the frontal sinus entirely and producing what is known clinically as the infantile type of sinus. Any infection in a nose of this kind tends towards chronicity.

To know the abnormal we must be familiar with the normal. In the child the nasal mucosa gives the appearance of being edematous and pits on pressure. This condition is mainly due to the rich blood supply, and where this is present we always find a rich venous return and a rich lymphatic system. This is particularly true here.

The middle turbinate body is essentially a portion of the ethmoid area; it is small, appears thickened and rounded, and runs parallel to the perpendicular plate, so that the lower border is deflected inward. At about the eighth year the ethmoidal ostia open into the nasal meatus. For surgical purposes, and especially in the recognition of morbid changes, the cells can be grouped into an anterior mass (communicating with the middle meatus) and a posterior group (opening into the superior meatus). The anterior mass is by far the most important at this time, for the external wall of these cells forms the inner wall of the orbit, and the possibility of orbital complications becomes at once apparent. The anatomical position of these cells is of great importance in diseased conditions, for infection can and does readily extend to the orbit because of the extreme thinness of the orbital plate, and orbital cellulitis and dacryocystitis result. The venous drainage of this area is very intimate and direct to the cranial cavity via the ophthalmic vein to the cavernous sinus and thence to the great dural sinuses. This fact has largely been responsible for the saying, "Beware of the ethmoids", and rightly so. The pathological changes in sinus disease in infants are not different from those in adults. The characteristic changes (chronic) are thickened epithelial lining with cells of the transitional type, cyst formation in the mucous glands, infiltration of the mucous membrane with inflammatory cells, increase in fibrous tissue, etc. The bony changes may be marked—e.g., thickened periosteum, areas of erosion, poorly calcified areas, and abscess formation in the bone. Small polyps in the sinuses are noted.

Next in importance after the ethmoid cells are the maxillary antra. These sinuses are always present at birth and can be of clinical importance. The cavity is very narrow or slit-like at birth, usually 7-8 mm. in length, and lies in direct continuity with the orbital cavity. It hugs the nasal wall. To three years growth is rapid, and height measurement lies between width and length. The growth of the sinus depends on eruption of the teeth and the development of the alveolar process. The antrum is in relation with the lower meatus only after the eighth year, usually. At the age of fifteen the sinus passes into the adult stage. The growth of the sinus in the early years of childhood is mainly in width, thus creating thin lateral walls and a thick caudal and posterior wall. The thick palatal wall and the thin orbital wall are the result. The mucous covering normally is thin and closely adherent to the bone;

but under diseased conditions this membrane may become extremely thick, and the bone adjacent, because of its soft, cancellous nature, may easily be involved, with abscess formation; and absorption may take place.

Dr. Schaeffer says that occasionally at birth the sphenoid sinus is of sufficient size to be diseased. The size at birth is 2 by 2 by 1 mm. The sinus at this time is purely nasal, it not being surrounded by the sphenoid bone until the third year. The growth in childhood, however, may be precocious, the sinus developing mainly in width, causing thin lateral walls and thick septal and dorsal walls. It early comes in contact with the ophthalmic and maxillary nerves, thus causing neuralgia of the trigeminal as early as the third year. The vidian nerve, with its accompanying vessels, establishes an intimate relation with the sinus as early as the sixth year. The sinus is early of importance clinically and by the third year has assumed enough size to be considered 5 by 4 by 2 mm. In its growth its recesses may encroach variously upon (1) the foramen rotundum with its contained maxillary nerve; (2) the foramen ovale with its contained mandibular nerve; (3) the sphenoidal fissure with its contained ophthalmic nerve, trochlear nerve, oculomoter nerve, abducens nerve, and the internal carotid artery. Occasionally it may come in relation with the optic nerve, at times entirely surrounding its sheath. The mucous membrane of the sphenoidal sinus is continuous with that of the nasal cavity and is subject to the same pathological conditions. The bone separating this sinus from these important structures is often of egg-shell thickness, at times deficient in places. In diseases of the sphenoidal sinus it is well to recall the intimate anatomical relations of the important structures. Optic neuritis, even blindness, may ensue. Infection of the sphenoidal sinus may lead to cavernous sinus thrombosis. Certain of the cranial nerves may be paralyzed. Ventrally, the cavernous sinus receives as tributaries the ophthalmic vein and, farther dorsad, veins from the dura mater. Moreover, the two sinuses are interconnected. The anatomy is such that cavernous sinus thrombosis and infection may follow ulceration of the nasal mucosa, empyema of the other nasal sinuses, alveolar periositis, infections of the face, and infections of the diploic tissue of the forehead. Naturally, therefore, in obstruction of the blood flow through the cavernous sinus there would be edema of the eyelids and face and exophthalmos; and if structures in the sphenoidal fissure were involved, there would be ptosis, pupil irregularities, strabismus, pain, etc.

Turning now to the last and least important nasal sinus in infancy and childhood, the frontal sinus, we find only rudiments of this sinus present at birth. There is no certainty of its presence until the end of the first year. By the twentieth month the sinus has eroded and ascended into the vertical portion of the frontal bone. The sinus is an outgrowth of one of the anterior ethmoid cells, merely a cell growing into the frontal bone, and it is uncertain before the second year which ethmoid cell will be the frontal sinus. After this time the sinus grows rapidly and extensively in the horizontal plane. The inner plate is very thin, with dehiscences sometimes present in the dural and orbital walls; while the anterior wall is thick and hard. The average size the first year is 2 by 2 by 3½ mm. Adult development does not occur until the

eighteenth year, and the anatomical and surgical relation differs in no wise from that of the adult sinus. Variations in size and shape are so constant that there is no normal in this respect.

Admitting the fact, then, that the paranasal sinuses in infants and young children do exist and are so anatomically situated as to readily involve the contiguous important structures whenever any pathological changes exist in them, can we escape the fact that many local and constitutional disturbances often confronting us are due to their involvement? The acute infectious diseases of childhood—measles, scarlet fever, diphtheria, pneumonia, influenza, etc.—are ushered in by nasal symptoms. Many chronic diseases (constitutional) are characterized by nasal symptoms. The universal presence of enlarged adenoids in children makes pathological changes in the mucous membrane of the sinuses very common. As long as the normal relation of structures exists, and the ventilation and drainage is maintained, these infections can be overcome. Aside from this, two other important etiologic factors in producing sinus disease exist; namely, climate and diet. Moist, cold, changeable weather predisposes; so also does a diet poor in fats. The most common source of infection is from diseased tonsils and adenoids, the adenoids acting as a trap for secretions coming down from the nose and the tonsils because of continuity of tissue. It has so often been said that there are no good tonsils.

The symptoms of paranasal sinus infection, aside from those occasional cases of acute, fulminating infection of the ethmoids, which usually are so outstanding that there is little room for errors in diagnosis, are many. Dean tabulates twelve. Mentioned in order of their importance they are: Continuous colds in the head, nasal stoppage, sneezing, asthma, headaches (the kind not relieved by the wearing of glasses), cervical adenitis, recurrent fever, cyclic vomiting, pyelitis, chorea, bronchitis, and arthritis. Many digestive disturbances, especially in infants, are traceable to the sinuses as the focus of infection. Here may be mentioned failure to gain, poor appetite, restlessness, anemia, vomiting, listlessness, malnutrition, indigestion, colitis, etc.; in short, the condition commonly attributed to diseased tonsils and adenoids. When these symptoms persist after the tonsil and adenoid operation, we have strong evidence that there is a focus of infection in the sinuses. With a negative report from the pediatrician, especially after the tonsils and adenoids have been removed, and the continuing of the symptoms for which the operation was done, the sinuses should be thoroughly investigated.

The diagnosis of sinus infection with a typical history containing many of the above-mentioned symptoms is usually a simple matter, especially when the clinical findings agree. But in other cases there are many pitfalls awaiting us, and the diagnosis remains in doubt to the end. It is in these border-line cases that we as specialists are often called upon to give an opinion. One examination may give negative results, and still the condition is there. Hospitalization over a period of days, with several examinations, will be necessary in some stubborn latent cases to establish the diagnosis. There are many workers in this field who state dogmatically that skiagrams give the only reliable means of diagnosis: e.g., Onodi, "That a reliable diagnosis of ethmoid affections in children can only be obtained by skiagrams". Also, Haike says: "The skiagram

offers the only reliable diagnosis of ethmoid affections in children, despite its limitations." Of course, no one method of diagnosis is infallible or should stand alone; it should be considered with the other facts presented. These two men admit there is much room for error in skiagrams of the antra and especially the sphenoids in children. It is a well known fact that little, if any, information of value regarding the sphenoid sinus in infants can be obtained by skiagrams. The solid body of the sphenoid bone throws too dense a shadow at an early postnatal period. There may be some possibility of differentiation after the age of three years. Concerning the antra, the skiagrams are confusing, because of the dense shadows thrown by the first, second and third molar teeth and the petrous portion of the temporal bone overlapping the antral picture. In the child the bones are soft, hence at the best the pictures must be blurred and indistinct. Another difficulty is to keep the patient quiet during the exposure. Ethmoid cells in children often appear indistinct and blurred in skiagrams, and the picture is so narrow that it is difficult to arrive at a definite diagnosis. Thus even moderate congestion of the mucosa may veil the lumina of these cells. The author's belief is that one ought always to be guided more by the results of clinical examination than by the skiagram. The x-ray is a secondary aid in diagnosis, especially applicable in diseases of the sphenoids.

When, however, it comes to treatment and operative measures the skiagram assumes the role of paramount importance. Dean says: "The greatest benefit to be derived from the x-ray examination is to tell whether or not a given sinus is present; and, if present, whether, on an anatomic basis, it has clinical significance." The x-ray does in most cases determine the anatomy, presence of and infection in the sinuses, and no proper understanding of a case can be had without it. For operative work a good plate is essential.

Admitting the fact that of all the aids we now have in successfully diagnosing this condition the x-ray stands paramount, still the diagnosis can often be made by the history and clinical course. It is no doubt true that anterior rhinoscopy is often unsatisfactory, due to the narrow nares and the difficulty in keeping the patient quiet; that posterior rhinoscopy is impossible; that transillumination is not reliable at all on account of the thick palate bone; and that the nasopharyngoscope may give misleading pictures; too, the size of this instrument will not permit entrance into some small nares. A smaller instrument known as the antroscope is now on the market, and with it one can enter the smallest nasal cavity and often locate the site of the discharge. Sinus infections, associated as they are in the chronic form with marked changes in bone and periosteum, and accompanied with severe systemic conditions such as arthritis, chorea, asthma and nephritis, present difficult problems to solve; and the correct diagnosis would often be missed without the x-ray.

The treatment of paranasal sinus disease in infants and young children, aside from the acute cases, is as a rule a very simple procedure, for ninety per cent of the cases are cured by the removal of the tonsils and adenoids, with simple toilet of the nose and the proper diet. The other ten per cent. can only be eradicated by the seeking of a proper climate and the expert services of a rhinologist. Moist, changeable weather is very conducive to sinus trouble, and the most important thing

in the prognosis and progress of this disease is the ability of the patient to seek the proper climate. Oftentimes the affection will disappear like magic on getting the patient into a warm, dry climate. The second most important thing in the treatment is the diet. It has been proven experimentally that rats fed on a defective diet, one deficient in fat-soluble vitamin A, develop an infection of the nasal sinuses; while other rats under the same conditions but with the proper diet did not develop sinus infection. Also it has been asserted and proven that in children, who had failed to improve or get well after all was done for them that could be done from a rhinological point of view, a cure resulted when the proper diet was given. Dr. Daniels, of Iowa University, states this diet as: (1) milk, one quart a day; (2) one egg; (3) whole wheat bread twice a day; (4) butter; (5) three vegetables, not including potatoes; (6) cereals; (7) three fruits, one raw; (8) meat for older children, and (9) cod liver oil, one-half ounce a day. Patients will, moreover, make improvement without definite medical or surgical procedures simply by adding the above articles to the diet. Proper hygienic conditions as to dress, footwear, and the living and sleeping rooms are of importance. Abundance of sunlight is essential in the treatment. To eradicate the last trace of sinus infection requires a great deal of patience, skill, and time. The local treatment in chronic suppuration of the paranasal sinuses consists in daily alkaline nasal douches followed by suction and instillation of astringent drops into the vault of each nostril. After a few days the antra may be aspirated and, if found diseased, a hole made into the naso-antral wall and tube inserted through which the sinus may be irrigated and treated. This is a court of last appeal and should be resorted to only in case the sinusitis refuses to yield to persistent energetic treatment, and when there is a severe local or systemic complication that would justify operation. In ethmoid suppurations it may be necessary to fracture over towards the septum the middle turbinate body and possibly uncap the ethmoid cells, to insure the proper drainage and thus obtain a cure; but whenever possible all operative measures, especially those requiring destruction of functioning tissue in the growing child, should be avoided.

Case Reports

Case 1. Grover A., age 8 years. *Past History:* He had always been a healthy boy, well nourished and developed. At age of four he contracted measles, later mumps, but completely recovered from these infections. One year later he began to have frequent colds in the head, sneezing, complaining of headaches, and having occasional sore throat. For the relief of this condition the tonsils and adenoids were removed. For a year he was better. *Present Illness:* For the past six months the boy has had almost a continuous cold, sneezing frequently, and raises thick mucus from the throat in the morning. Complains of headache now almost all the time. Examination of eyes reveals no cause in the eyes for the headaches. *Examination:* The posterior pharyngeal wall has a thickened, hypertrophic appearance, and thick discharge is seen in the oropharynx. The tonsils are gone, but some tissue remains at the lower pole of each fossa. After spraying the anterior nares with cocain, pus was seen in the left middle fossa. Nothing further of a pathological nature was found in the examination. *Course*: The nares were

treated with compresses of three per cent ichthyol in glycerin, allowing them to remain in the nose for 20 minutes. An alkaline nasal douche was ordered to be used every morning at home and free catharsis. Office treatments given every two days for two weeks. Condition improved somewhat. Then, after thorough cocainization of the inferior meatal wall on the left side, I succeeded in passing a Coakley trocar and cannula into the left antrum, and the cavity was washed out. The cavity was washed out under local anesthetic at four succeeding sittings; and this, with the continuance of the daily douching, appears to have eradicated the sinus trouble. The boy has gained three pounds in weight and is free of the head colds.

Case 2. Gertrude F., age 3½ years. *Past History*: This was a normal baby, well nourished and developed. *Present History*: About three weeks before I was called in consultation the baby contracted measles, and the internist arrived just as the rash was fading. A few days later the baby became very sick; developed intense sore throat; temperature 104°; very toxic. The internist looked at the throat, took a culture and painted the tonsils with mercurochrome. Culture showed staphylococci and streptococci. A membrane was present in the throat, tonsils, nose and larynx. Thirty thousand units given that day. The heart began to fail, and supportive measures were given. When the author saw the case the throat was filled with thick mucus; nose filled with mucopus; and a membrane on the pharyngeal wall. Cultures taken showed the Klebs-Löffller organisms. Forty thousand additional units of anti-toxin given. The circulation apparently failed twice during the next two days, and a fatal outcome was narrowly averted. Temperature remained high. On inspecting the ears, both drums were red but not bulging. One day later myringotomy of both ear drums was done and pus evacuated from the middle ear cavities. Soon afterwards difficulty in swallowing developed, and anything taken by mouth regurgitated back through the nares. The ears began to drain profusely and continued so for four weeks. Cessation of drainage resulted in high temperature again. Additional myringotomies were done to maintain drainage. Progress was very slow, and in the meantime the weight had fallen from 28 to 20 pounds. Realizing the hopelessness of the case, it was decided to hospitalize the patient. Here, under the proper diet as outlined in the paper, daily irrigations of the nasal cavities with normal salt solution, followed by instillation of antiseptic drops into the vault of the nose, daily exposure to the sunlight, and daily cleansing of the ears, improvement was sudden and constant. In two weeks' time the child had gained 5 pounds. The right ethmoid cells suppurated and broke through the lacrimal bone and abscessed in the soft parts on right side of the nose. This abscess was opened and now is healed.

At a later date I plan to give a light anesthesia and remove the tonsils and adenoids, possibly uncap the ethmoid cells on the right side and fracture the middle turbinate over towards the septum of the nose.

DISCUSSION

Dr. James M. Parrott, Kinston: This paper is on a matter of unusual importance and is one of the most valuable papers which I have heard in some time. But there are certain discrepancies in it; that is, there are some errors in Dr. Broun's anatomical descriptions, to which I respectfully call his attention. In the first place, the sphenoidal sinus is developed from the nasal cavity and not from the ethmoidal

body. That is a very important matter to remember for treatment purposes and for prognostications. I understood Dr. Broun to say in his paper that the sphenoid sinus is developed not by lopping off from the nasal cavity, as it is, but by migration backward of ethmoidal cells. This, of course, is incorrect. I understood him further to say in his paper that he always found the antrum present in its proper place at birth. Of course, that is incorrect. The maxillary sinus, as we know it, is formed by the migration of the lower anterior ethmoidal cells; and frequently they do not become located and properly shaped, so far as their dimensions and so forth are concerned, until after the patient is three, four, five, or six years old, and even later than that in many cases. I stress those two points because I think they have an important bearing on the error into which he has finally dropped. He did the thing that most of us nose and throat men are doing, and what some of our very best men have done. That is, they think of the tonsils and adenoids as the cause of many cases of sinus infections, whereas exactly the opposite is the case, the tonsils and adenoids being secondary to the sinus infections.

I know that many of you disagree with me in that and agree with Dr. Broun, but I respectfully call your attention to the fact that the embryological development of the sinuses and the anatomy (as a result of their embryological development) of the lymphatic distribution is against the proposition that the adenoids and tonsils are the primary seat of the disease. Let us keep clearly in our mind that the anterior group of sinuses comprises the frontals, the antra, and the anterior ethmoids. All those enter the middle meatus of the nose below the middle turbinates, and that is what I mean by the anterior group—they are drained by the lymphatics through the tonsil itself. The posterior group, on the other hand, are drained through the group of lymphatics that go under the tonsil, or extratonsillar. The later infections of the posterior group are often the cause of enlarged cervical glands, which are not improved by removing the tonsils. I think the doctor will agree with my conclusions when I call attention to the anatomical facts. If we start out with the assumption that a man has a tonsillar infection and that as soon as that is cleared the antrum, for instance, will clear up, or the anterior group will, we are laboring under a wrong impression. Frequently those are the cases that come back to us afterwards complaining of not having improved. Pus does not travel upstream, like a fish; it goes with the lymphatic current; and when I see a case of tonsils and adenoids, I always investigate the anterior group to see if I have trouble there, in the beginning. If so, I go after that as well as the tonsils.

Dr. M. R. Gibson, Raleigh: This paper is on a subject that has been discussed by the foremost men in the nation for the last two or three years. Dr. Dean, to whom Dr. Broun referred several times, is doing wonderful work along this line. I happen to know Dr. Dean personally and have conferred with him on this subject, in which he is very much interested; and I have been trying to follow out his teachings to the best of my ability. The x-ray has been of great help to me in making diagnoses. In these cases I get my line of symptoms and then picture the case, and very frequently I have been able to remove the cause and condition simply by following up the x-ray and operating.

Dr. H. C. Willis, Wilson: I want to disagree with Dr. Parrott. Pus will travel uphill. Inflammation will, too. If the posterior sinuses are involved, that chain of glands will take it right on up, absolutely. If you have adenitis involving the cervical glands you will often find them involved down here (indicating) and it will gradually come higher up. What is the cause of that? That is going uphill, isn't it?

Dr. Broun (closing the discussion): Answering Dr. Parrott, the only thing I have to say is to refer him to Dr. Schaeffer, the great anatomist. I got these facts from his book.

THE TREATMENT OF ACUTE SINUSITIS*

L. N. West, M.D., F.A.C.S., Raleigh

The treatment of acute sinus disease is both medical and surgical. In a great majority of acute infections of the sinuses the patient will readily respond to medical treatment, because it is possible in most cases to get proper drainage from the normal opening. This treatment will have to be carried on chiefly at the office but should be supplemented by home treatment. All of the sinuses, with the exception of the sphenoid, have their drainage in the region of the middle turbinate bone. The openings are usually small, therefore a good part of the drainage takes place by syphonage. If these openings are clear, infection seldom occurs. As long as normal drainage and ventilation are present the infecting agent stands little chance with the mucosa of the cavity into which it has entered. Therefore, in any acute sinusitis it is our duty before advising operation to free as far as possible the normal outlet in order to evacuate the contained pus and to let in air. A sinus diseased and treated by operation, to the point at which the patient is discharged as cured, seems more liable to a reinfection than do sinuses in the same patient to become diseased which have not previously been affected. The title of this paper is the treatment of "acute sinusitis," but I can not go into the treatment of sinusitis without first mentioning some of the causes and the prophylaxis.

Any deformity of the upper part of the nose which seriously hinders free drainage may act as a predisposing cause of sinusitis. This does not mean that all malformations are associated with sinus disease. But it does mean that sinus disease occurs more frequently in this type of nose. The negro, with a broad nose, seldom has sinus disease; and, when he does, it is usually accompanied by syphilis or from direct extension from dental origin. Malformations of the nose, such as deflected septum, predispose to congestive troubles in general; and the sinuses are more liable to accident. After the inflammation has actually been established the deformity often increases the symptoms, makes treatment more difficult and prolongs the attack. These very simple cases become so aggravated by lack of free drainage and by the increase of inflammatory symptoms due to pressure that in spite of all treatment they become chronic. Congestion and hypertrophic conditions of the middle turbinate are another predisposing cause. Nasal polyps may be a cause of sinus disease, through their influence in occluding the channels of exit of these cavities; it is, however, generally conceded that they are far

*Read by title.

more apt to be the result of irritation due to a sinus discharge, and it is not likely that they can be eradicated without the latter being cured. Any inflammation may extend directly to the sinuses from the nose or nasopharynx, as in children with hypertrophied adenoids in acute infectious disease. Suppuration of the sinuses may be associated with chronic diseases, where the resistance is low, as in tuberculosis. However, the infection here is due to the same causes as in other cases. But it is a matter of record that sinus cases are more frequent in tuberculous patients. It was known long before otolaryngology became a specialty that sinus disease has also been due to dental irritation. It follows operation on the nose and very often from any operative work when the nose has to be packed. Sinusitis in children two years of age and over is common, and it can produce just as deleterious results as sinusitis in adults. Furthermore, it may produce these results without presenting symptoms which would be suggestive of its presence. It is possible for a child to have a suppurative discharge that is swallowed. In fact, it is seldom that children will expectorate. A much smaller discharge from an adult would give a history of postnasal dripping. I have seen a statement by Coakley that, "In a child without adenoids, and with a profuse nasal discharge, the patient has sinusitis." He advocates, however, non-surgical treament. Now, in general, any disease or deformity that will cause inflammatory conditions in the nose will predispose to sinus disease. The treatment is far from being perfected. The progress we are making is great, but we are far away from the final ideal treatment.

No two cases can be treated the same way. The infection may be the same, but each patient reacts differently to treatment. All patients with acute sinusitis should have every chance for relief, with the least possible injury to the physiological functions of the nose. We should be more careful in our examinations. We have no right to rush through work. You can not make a diagnosis of sinusitis merely by inspection of the nose. All suspected cases should have a complete physical examination. The nose should be inspected under cocain and adrenalin. A very careful history should be taken, and all the sinuses should be transilluminated and x-rayed. Bear in mind the easier the diagnosis the harder the cure, so time well spent in clearing up the simple, more obscure conditions will save many a chronic case. The first symptoms of the invasion of the accessory cavities are not always recognized. So we may take for granted that in certain severe attacks in inflammatory disease of the nasal cavities, the sinuses must always almost of necessity be involved. We cannot neglect acute colds and allow them to run their course. If we do, we increase the number of chronic sinus cases. If treatment is started early in all acute conditions of the nose, we know the number of cases coming to operation will be reduced.

The principles of treatment applicable to these cases are based on ordinary rules of common sense and experience in the management of inflammatory conditions in general. The patient should at the beginning of suspected sinusitis be put to bed and kept warm, magnesium sulphate or something similar given and fluids forced. Numerous drugs are recom-

mended, but just what remedies are the most reliable in acute cases each observer must determine for himself. Local treatment to the nose is the most important of all. But remember all treatment at this stage should be absolutely non-irritating.

The nose should be sprayed with cocain and adrenalin, followed with a douche of normal salt solution or a solution of bicarbonate of soda at a temperature of 110 F., then the nose coated with a spray of some soothing oil. This treatment should be done at home. Following the very acute symptoms the patient is allowed to come to the office for treatment. The treatment here is very similar to the above, only I add to this packing the nose with a 20 per cent solution of argyrol, after it is well cleaned, and then using negative pressure. This method provides drainage and ventilation to the sinuses, improves the tone of the mucous membrane and makes possible the avoidance of a large percentage of the operative procedures within the nose or upon the sinuses. These treatments are carried out daily at the office. I sometimes add to this stock vaccines, the stock vaccine being used on account of the length of time required for the making of the autogenous vaccine. Do not forget that these cases must drain through their normal openings, and these should be kept clean. Push the middle turbinate toward the septum, if obstructing any of these outlets; remove polyps, if present, for better drainage. The septum at times will have to be removed, but in any or all of these operations do not pack the nose. On the surgery of the sinuses, like the drugs used in this condition, I have very little to say. Do the operation you have been doing, but remove nothing from the nose that has a physiological function to perform. I know all of you have seen cases in which the middle turbinates, together with the ethmoid labyrinth, had been removed for a cure of what seemed to be at that time an ethmoiditis, which later proved to have been wrongly diagnosed and really was a maxillary sinusitis.

The order in point of frequency of infections of the nasal sinuses is: (1) maxillary, (2) frontal, (3) ethmoid, (4) sphenoid.

I shall feel that I have been justified in presenting this paper if for no other reason than to impress upon your minds the importance of prevention of sinus trouble and the early treatment of acute infections of the nose. Do not be satisfied with a diagnosis of sinus trouble by one inspection of the nose. Eliminate all possibilities of a maxillary or frontal sinusitis before you sacrifice the middle turbinate and the anterior and posterior ethmoid cells. The nose has a definite function to perform, and when its structures are removed they cannot be replaced.

I realize fully that I have taken up all of my time telling you how to prevent sinusitis rather than how to cure, as the title of my paper suggests, but I feel that the treatment is more preventive than anything else, and therefore I do not apologize.

In closing, let me repeat: Recognize early the conditions that predispose to sinus trouble and, if possible, remove them. In children, remember adenoids are a very common cause of sinus disease; their removal usually causes a cure. Correct all deformities that have a tendency to cause obstruction, and guard the patient against the various exciting causes which may determine an acute attack. Finally, apply early treatment when acute inflammation is theatened.

REPORT OF COMMITTEE ON TONSIL-ADENOID CLINICS*

Dr. V. M. Hicks, Raleigh (Chairman), reported for the committee as follows:

I hold no brief for or against holding the clinics in North Carolina. I simply wish for you to know the problems as they presented themselves to this committee, and the solution we decided on. The committee met in Greensboro on June 7, 1925. All of the members of the committee were present, as also was Dr. Cooper, Acting Secretary of the State Board of Health. When the committee met, we realized that we were not there to solve this problem according to our own feelings but to arrive at a decision which would as nearly as possible express the sentiments of the majority of this section.

You will recall that at our last meeting there was considerable criticism of the method of holding the clinics, and there were also some favorable comments. We took all those into consideration, and the first problem that presented itself in the holding of these clinics was the fact that they had been made popular publicly. I think you will agree with me that the public like the idea of holding tonsil and adenoid clinics in North Carolina. Certainly our legislature likes it, and the committee representing this section was unwilling to take the responsibility of abandoning these clinics, because the responsibility would fall upon us as your representatives. Dr. Cooper agreed to certain modifications of the previous rules, and I shall give you the ruling of the committee as determined upon at its meeting in June, 1925.

Briefly, the ruling was that no clinics were to be held in a county which had had one clinic within three years; no clinics were to be held in a county having both a hospital and a specialist; and that the work was to be confined as far as consistent to those children most needing the service and least able to pay for it. I want to say that the State Board of Health has adhered very strictly, as far as I have been able to determine, to the ruling of our committee.

Dr. Cooper asked that certain modifications be made to this ruling this spring. The committee conferred, and it was decided that we would not change the rulings of the committee, but that we would present the matter to the section at this time for its disposition. Dr. Cooper has presented his side of the problem, and I will very briefly state it. As a result of the restrictions imposed by the committee, there were thirteen county clinics held, which is about half or less than half the work done in each of the preceding years. 1272 children were operated on, and 570 of them or slightly over 40 per cent were done totally free of charge, their ability to pay being passed upon by the county authorities. With the exception of the salaries of the nurses, it costs as much to do this work for three months as it does for six months, for it takes about as much overhead appropriation and expense. (Here is the important point as far as Dr. Cooper is concerned, and I think we ought to appreciate this, because he has to take such matters to the legislature.) Of the slightly more than 55 per cent who paid the fee of $12.50, a big majority of them could be easily classed as unable to pay, leaving only a very

*Members of committee: Dr. V. M. Hicks, Chairman; Dr. J. P. Matheson; and Dr. R. L. Daniels.

small proportion of the children in the class of those well able to pay. Dr. Cooper comes back to the proposition in his letter to the committee. After all is said and done, if we are going to hold these clinics in the various counties, the matter ought to be left to the county societies to decide; and as far as the ability of the individual patient to pay is concerned, or the admission of that patient to the clinic, that can be very well left to a committee from the county society. It seems to me that is basic. They are perfectly willing to do that. They are perfectly willing to abandon these clinics, if this section will accept the responsibility for doing it.

We have discussed this matter from year to year in this section, and the report that I give you is as far as we were able to get in the solution of the problem.

Dr. J. W. MacConnell moved that the report be received, the action of the committee approved, and the committee continued. Motion seconded by Dr. R. S. Beam. After full discussion, the motion was carried.

NOMINATION OF CHAIRMAN

On motion of Dr. J. W. MacConnell, Dr. John B. Wright, Raleigh, was nominated for recommendation to the president for appointment as chairman of the section.

Dr. V. M. Hicks, Raleigh, on motion of Dr. James M. Parrott, was re-elected as secretary of the section.

SECTION ON CHEMISTRY, MATERIA MEDICA AND THERAPEUTICS

CHAIRMAN: G. H. MACON, M.D., Warrenton.

THE VALUE OF VERATRUM IN CERTAIN HYPERTENSION CASES

WM. DEB. MACNIDER, M.D., F.A.C.P., President State Medical Society, Kenan Professor of Pharmacology, University of North Carolina Medical Department, Chapel Hill.

I have visited different city and county society meetings and have discussed this subject with them, so I thought it would not be out of place to say something about it here.

I have the feeling that veratrum and aconite are two very much misunderstood drugs. There are two very clear-cut attitudes toward these drugs. The younger group of physicians consider them as dangerous poisons, as powerful circulatory depressants with respect to the heart (the heart being slowed by depression of the heart muscle), and that therefore they should never be given.

There is another group of physicians, the older group, who have used both of these drugs for years, and they consider them perfectly safe and valuable therapeutic agents. The two drugs have dropped into disuse somewhat, I think, because they are not new. The tendency now is to employ anything that is new, and discard anything that is old, very largely because it is old.

When you give veratrum to animals (and, as far as I can tell, I feel quite sure the same statement holds true for man), two things take place: marked slowing of the heart, with a decrease in the output of blood by the heart in the blood-vessels as a whole—and that, in itself, is a valuable effect to have in some conditions; and, the second thing that happens, the big vascular field, the big area of blood-vessels in the abdominal cavity, dilates somewhat.

So what you have as a result of using veratrum is a decreased output of blood, and that decreased output of blood is put into a vascular field the size of which has been increased. If no other change takes place, there is only one thing that can happen, and that is a fall in blood pressure—and there are some conditions, we know, in which a fall in blood-pressure is a desirable thing to induce.

The first question that arises is: How is the heart slowed and how are the abdominal blood vessels dilated?

If the heart is slowed by depression of the heart muscle, I think it means that the use of the drug is associated with some danger. It doesn't have that effect when it is given in therapeutic doses. The slowing of the heart from veratrum when given in therapeutic amounts is due to the drug stimulating the vagus nerve center in the brain.

The mechanism by which the heart is slowed is a safe mechanism when the drug is given in therapeutic doses. The dilatation of the abdominal blood-vessels is mainly due to the drug depressing the muscle tissue of

the vessels, which you can demonstrate by taking a loop of intestine out of the body and running a solution of veratrum through it. It is separated from the central nervous system and the sympathetic nervous system, and yet when you do this, these vessels dilate and the loop of intestine swells. The vessels are not dilated by the drug depressing the vascular center, which is a dangerous way to dilate blood vessels.

If veratrum is given in large quantities, very large quantities, you get a secondary slowing of the heart. That secondary slowing of the heart is due to a depression of the heart muscle, the proof of which is found in the fact that the heart is slowed after the vagus nerves have been cut. They are no longer operative, and yet you can secondarily slow the heart, and that slowing is due to depressing the heart muscle. So the two points of view, the point of view of the older physicians and the point of view of the younger physicians, are not in conflict. If the varatrum is given in therapeutic quantities it slows the heart in a perfectly safe fashion and is safe. If given in toxic quantities it further slows the heart by depressing the heart muscle, which is not a safe way to slow the heart.

There is no necessity for getting excited over such a statement. Strychnin sulphate will produce convulsions, but the mere fact that this drug will produce convulsions doesn't prevent us from using it. We don't use it in toxic quantities sufficient to cause convulsions; we use it in therapeutic quantities.

With this understanding of veratrum, it seems to me it is a valuable drug in certain conditions. They are conditions of high blood pressure, pregnancy, and other states, usually due to a vascular spasm, a sudden contraction of the muscle tissue of the blood-vessel walls. All high blood-pressure is due not to a functional change in blood-vessel walls but to a structural change, the formation of fibrous tissue and a laying down of calcium salts in that fibrous tissue.

So far as I know, there is no drug, except a stick of dynamite, that can dilate fibrotic and calcified blood-vessels. That goes beyond our zone of usefulness, unless the connective tissue is syphilitic in origin. But there are a great many things, toxic conditions, worry, fright, the use of tobacco and, I hate to say it, but maybe the use of alcohol, that cause a constriction of blood-vessels—not a structural thing but a functional thing—and the drug that is indicated there is something to dilate the blood-vessels by a depression of muscle tissue in the blood-vessel wall, to increase the vascular field, and lower blood-pressure in that way; and, secondly, to decrease the output of blood into that vascular field—and this is what veratrum does.

It is my feeling that we don't know much about pregnancy toxemias. There is a certain dry type of pregnancy toxemia in which the blood-pressure condition appears to be the main factor; there is a high blood-pressure; no structural changes in the vessels, but a spasmodic contraction of them. I believe in that type of case veratrum is of great value in lowering the pressure, preventing damage to the kidney and to the brain and perhaps enabling the pregnant woman to advance far enough in pregnancy to bear the child.

In the high pressures from kidney disease, if the pressure is not essentially due to structural changes in the blood-vessels, I think veratrum is of value to dilate the blood-vessels and lower the pressure. And, to my mind, in cerebral hemorrhage, veratrum finds an ideal use. What you certainly want to do there is to get the blood away from the brain and if you can dilate the abdominal vessels and deflect it in that direction, you can help out conditions. If, on top of that, you can slow the heart and decrease the output of blood into the vessels, you will tend to further lower it.

I feel very certain from laboratory work and from some clinical work and the reports of clinical cases that physicians have been kind enough to send me that veratrum is a drug which should be used more extensively than it is used in conditions of high blood-pressure, in which the high blood-pressure is mainly due to a vascular spasm, a so-called vascular crisis. I feel that if the younger men would show the interest in it that the older men do it would be of distinct service to them in certain selected cases of high blood-pressure.

DISCUSSION

Dr. Ben H. Hackney, Lucama: There are two or three things I want to mention in regard to my practical experience in using veratrum to lower blood-pressure. I have found from special observation in four cases recently in the use of veratrum that the lowering of the systolic blood-pressure was out of proportion to the lowering of the diastolic blood-pressure. Take a given case, where veratrum in large doses for eight or ten days will give an average lowering of the systolic blood-pressure of around 30, and on the other hand produce a lowering of the diastolic blood-pressure of 8 or 10. I tried a case that I had kept in bed for a month, a case with high blood-pressure. There were two nurses on the case, and they had been taking this man's blood-pressure every four hours for a period of four weeks. He was showing this regular decline in the systolic pressure, but not in the diastolic pressure. I put this patient on digitalis with the veratrum, giving rather large doses of tincture of digitalis (as much as 80 to 90 minims), and in four days it lowered his diastolic pressure from 130 to 95. Then we decreased the digitalis, and we kept his diastolic pressure under 100 with the veratrum. We kept this up, taking his blood-pressure every four hours for ten or twelve days. We left off the digitalis and in four or five days his diastolic pressure went up again. We put him back on the tincture of digitalis with the veratrum and it was lowered again, and at the same time that it lowered his diastolic pressure it lowered his systolic pressure, more than the veratrum did alone.

As that looked to be of great benefit to the patient, I tried it in three other cases that were not under as close observation as the one I just reported, and I found that the diastolic pressure was lowered more with the digitalis than without it.

The thing that I would like Dr. MacNider to answer for me is whether this was a coincidence, or whether it was due to the right and left heart being out of balance, and so slightly that I couldn't determine it.

Dr. W. H. Moore, Wilmington: I didn't hear all of Dr. MacNider's paper, I am sorry to say, but I want to tell you that I am using vera-

trum right now in a case of eclampsia, on my service in the hospital. Of course, I give hot packs, and so forth, but I have been able to control the blood-pressure with enormous doses of veratrum given every four hours. By this treatment, the pressure was reduced from 200 to 135. When I discontinued the treatment for one day, the pressure bounced back to 160, without any other change; I put the patient back on the veratrum and in another day's time it was back down to 126.

I have used it in high blood-pressure with angina pectoris, and in two cases I got very good results. In another, I didn't get very good results; it didn't seem to agree with the patient, somehow. She became weak without any appreciable reduction in the pressure. I don't know what the reason was, but it didn't agree with her.

I have used it in cases of high blood-pressure with nephritis, and even there it seemed to have a beneficial effect. I had one case of nephritis that I put on citrocarbonate and tincture of veratrum in twenty minim doses. She was running a blood-pressure of 200 (it had been as high as 230), and we were able to bring it down to about 150 and keep it there, not continuing the veratrum, but when she feels she has a high pressure and her head feels full, she starts back on it and it reduces the pressure very nicely. I think it is a wonderful thing.

Dr. O. C. Daniels, Oriental: When I was a general practitioner, I never went anywhere in my practice that I didn't carry some of Norwood's tincture of veratrum with me. I say Norwood's tincture of veratrum, because I never could get any results from any other kind. I always got good results from Norwood's, however, and I didn't know how to treat a case of eclampsia without using it. You certainly can get a slowing of the heart and dilatation of the blood-vessels from the use of the drug, and if you care to go far enough you can get all the vomiting you want. I have also seen purging, as a result of the administration of the drug to the physiological limit, and given hypodermically.

Of course, in the last few years I haven't used it in many cases. I will cite one case in which it was used. I don't know whether I used it rightly or wrongly. I had a case come to me with excessive hemorrhage from the patient's nose, the cause of which I didn't know; the spot could never be located. I used every drug that I knew anything about or ever heard of to stop nasal hemorrhage. I had as good a practitioner as there was in Goldsboro in consultation with me; in fact, I had two. I packed the patient's nose posteriorly and anteriorly, and all in between, and all of a sudden he would break loose with a hemorrhage.

We decided to give this patient veratrum viride. I am sure we gave him Norwood's tincture. The patient had quite a high blood-pressure. We apparently thought we were controlling the hemorrhage all right, when suddenly, somehow, somebody gave that patient an extra dose. I have forgotten all the particulars.

At any rate, they telephoned me during the night that my patient was dying. I didn't take long getting to the hospital, and when I got there I found my man totally unconscious, in a cold, clammy perspiration, and practically pulseless. I thought to myself if he wasn't dying, he

was mighty close to it. I didn't know what else to do, so I took an ether-cone and gave the fellow inhalations of ether, which brought him around in a very few minutes.

One of my preceptors told me once upon a time that you could not give enough veratrum viride by mouth to kill a patient. I think it was given hypodermically to this patient. He came out of it all right; he didn't die that night, and he didn't have any more hemorrhage.

I regard veratrum viride and always have regarded it as a very good drug in proper and selected cases.

Dr. L. B. Evans, Windsor: I, too, use veratrum viride in eclampsia with very good effect, and shall continue to use it as long as I have cases of eclampsia with high blood-pressure. But I shall be a little slow, Dr. MacNider, about using it in cases of cerebral hemorrhage. I can see perfectly well, where you anticipate a cerebral hemorrhage, you could use it with impunity; but after your hemorrhage has started, as in an apoplectic stroke, no matter how high the blood-pressure, I would be afraid to use it, because of a case I had only two weeks ago.

I was called to see a negro man fifty-one years old, a strong, vigorous man who had never been sick before. He had had a knockout stroke. He was almost dying. I expected him to die before daybreak. It was early in the evening, about eight o'clock, when I saw him. I took his blood-pressure, and it was 220 systolic. I gave him my usual dose of one c.c of Parke-Davis's veratrum viride and started back to my car to get my stomach pump. I thought I would relieve his stomach and see if that would do any good. Before I got to the door he had one violent convulsion, and he was dead.

I would be afraid, therefore, Dr. MacNider, to use it where the hemorrhage had already started.

Dr. MacNider (closing the discussion): I simply can't answer Dr. Hackney's question. I don't know why the use of digitalis with the veratrum should have more effect on diastolic pressure than veratrum itself. It is simply a matter of ignorance on my part. I don't know how to explain the facts that he has stated.

There are two tinctures of veratrum: the official tincture and the unofficial tincture, the Norwood's tincture. The official tincture for years was a valueless drug because it was not standardized biologically. It is standardized biologically now and I think very likely it is as active as we need it.

The statement Dr. Daniels made, in contrasting the action of the standardized official tincture with the Norwood's unofficial tincture, is one that is made very commonly. As I recall it, Norwood's tincture is about six times as strong as the official tincture.

I don't like to make any suggestions to a practitioner with the understanding of medicine and the experience of Dr. Evans. My feeling is that the death of the case he was reporting was due to the fact that, with the very high pressure this man had, coincidentally with the giving of the veratrum he had an extension of the hemorrhage, as shown by the convulsion, and died as a result of it. What happened was a pure coincidence. The type of case that Dr. Evans was talking about is just the kind of case that, theoretically, I should think veratrum would be of value in—a strong, robust, young man, not much structural change in

the vessels, mainly a functional thing, a vascular spasm, very high blood-pressure, fast heart. It seems to me that is just the type of case in which, if you could slow the heart, decrease the output of blood, and dilate the abdominal and peripheral vessels, you would do good.

I feel that in just the type of case he has discussed nitroglycerin is very definitely contraindicated. I believe it does a great deal of harm in high cerebral pressure and in cerebral hemorrhage, for this reason: the only way that nitroglycerin can dilate the blood vessels is by depressing the walls of the blood vessel, and when you give it you get an increase in the heart rate. If you give nitroglycerin and it dilates the abdominal vessels out of all proportion to the dilatation of the cerebral vessels, you get a fall in cerebral blood-pressure, but if you get a dilatation of the cerebral vessels at the same time you get the abdominal vessels dilated, you may get an increased amount of blood to the brain, whereas the thing you want is a decrease in the amount of blood.

There is a great difference of opinion about the value of veratrum in high blood-pressure cases, and I think the reason for it is just this: the only way it can lower the blood-pressure is by relaxing the blood-vessel and slowing the heart. In vascular spasm I think it is of value.

If you have an arteriosclerosis, where the blood-vessels are more or less obliterated and narrowed by the formation of connective tissue, it is not going to lower the pressure much, for the very simple reason that tissue in the vessels on which it acts, muscle tissue, is not there, but has been replaced by fibrous tissue. It can't act, because it hasn't anything to act on.

I believe that is the reason why one person will be enthusiastic about its use, and another person will not be. I believe that explains why it is of so much value in some of the high pressures in pregnancy, because it is given in those cases to people under forty, where the blood-vessel condition is a spasm and not a structural change, which veratrum cannot influence.

HEXYLRESORCINOL IN THE TREATMENT OF PYELITIS

L. H. Justis, M.D., Littleton.

It is my object in this paper to bring before you the treatment of pyelitis not only in adults but also in children. Because renal pelvic lavage cannot be employed in young children with the same facility as in adults, and because a goodly number of our adult patients are unable, for financial reasons, to obtain such treatment, it is particularly welcome to our patients and to ourselves that we have a much more efficient urinary antiseptic that can be administered by mouth. As has been pointed out before, Hexylresorcinol, or Caprokol, is the one drug that seems to meet all clinical and experimental qualifications—i. e.: (1) It is a stable chemical compound; (2) it is non-toxic in therapeutic doses; (3) it is non-irritating to the urinary tract; (4) it is eliminated by the kidney after administration by mouth; (5) it is bactericidal in high dilution in urine of any reaction.

Form of Administration: Numerous forms of administration of this drug have been tried. Experimentally, normal men receiving Caprokol secrete bactericidal urine with a greater degree of expectancy if the drug

is dissolved in olive oil than in any other preparation thus far tried. This is due to prompt absorption from the small intestine. A soluble gelatin capsule has been devised for adults, containing a 25 per cent solution in olive oil. Due to the size of the capsule this was found to be impracticable for children, and recently a 2.5 per cent solution of Caprokol in olive oil has been employed. This is probably the most convenient form of administration and can be given without any relation to feeding. In my rather limited experience with this drug I have found that, to obtain the best results, rather large doses must be given. For adults I began with two capsules three times a day after meals and quickly increase to four capsules. In treating children I give one dram of 2.5 per cent solution three times a day, quickly increasing to two or three drams. In very rare cases, especially in children, the patient is unable to tolerate large doses. This is manifested by diarrhea and cramping pains in the abdomen. I have had one such case, and because of the urgent need of the drug I did not discontinue the treatment but reduced the dose, and in four or five days these symptoms had entirely subsided.

Management: The diet, of course, is of the same importance as before. Water is given in moderate amounts. No soda is given during the course of treatment. This, of course, is because excess water and soda in any quantity raise the surface tension of the urine, thereby robbing it of its bactericidal properties to a marked degree. As has been stated before, Caprokol is non-toxic in therapeutic doses, so if the best results are not obtained in thirty to sixty days, the treatment should be kept up for at least ninety days. A cure can only be obtained, in a large percentage of cases, by long and persistent treatment.

Because of the lack of efficient laboratory facilities I have been unable to isolate the specific offending organism, but knowing B. Coli is the most frequent cause, I have gone upon that assumption.

Clinical Results: The following case reports show, I believe, the average results that we may expect to obtain from Caprokol.

Case 1. M. S., female sixty years old. Diagnosis of pyelitis was made fifteen years ago. She was told that her urine had not been entirely free of pus during this long period. In spite of more or less continuous use of urotropin and other drugs, she had had from eight to ten attacks each year with temperature ranging from 101° to 104°. She was put on Caprokol about fourteen months ago, one box of one hundred tablets being given. Six weeks after this treatment was discontinued, she had a chill, with temperature 103°, and pus in abundance was found in her urine. She was again put on Caprokol, continuous treatment for ninety days. Ten months later the urine shows no evidence of pus. She states that she has not felt so well since her first attack fifteen years ago. This, to my mind, is an excellent example of the results we may expect from long and persistent treatment of chronic cases.

Case 2. A. S., twenty-three months old. When I first saw this child, she was vomiting and having eight or ten green, watery stools daily. She looked very toxic, and I considered her a very sick child. In obtaining her past history, her mother stated that she had had repeated attacks of this type for the past six months. With the usual treatment the child cleared up in about ten days, but three days later had a chill, with temperature 105°. On examination of the urine I found pus in abundance. The soda which she was getting at this time

was discontinued. The next day Caprokol was begun, increasing the dose rapidly because of the urgent need to free the kidney of such an abundance of pus. Four days later she started with pain in her abdomen and diarrhea but no vomiting. On questioning her mother very carefully as to the previous attacks, she said that the child had never had diarrhea without first having had an attack of vomiting which lasted from six to eight hours before diarrhea began. I did not stop treatment nor add to what I was giving but reduced the dose from three drams t. i. d., to one dram t. i. d., the diarrhea and cramping clearing up in about four days. She made an uneventful recovery after this. The treatment was continued for sixty days. The urine has been entirely free from pus since that time. She has gained about six and a half pounds.

Case 3. F. H., age thirty-one. He came to me complaining of frequent and painful urination with some blood, temperature 102°, pulse 120. I gave him urotropin and soda without result. Caprokol was started ten days after onset. In eight days the pain and frequency of urination had entirely disappeared, and a very little pus was found in the urine. This, I believe, was pyelitis complicated by cystitis. This has been only six weeks, so it is impossible for me to say just at this time what the outcome of this case will be.

The question has frequently come up as to whether or not Caprokol is contraindicated in nephritis. I am now treating a young woman who several months ago developed a very severe acute nephritis. She had some infection of the urinary tract later and was put on Caprokol. No definite improvement was noticed for ten days. She then began to improve. The albumin has gradually decreased in five weeks from almost solid on boiling to a faint trace. Her general condition is much better and she is gaining in weight. Of course, the usual nephritic diet was carried out in this case.

Conclusions: On the basis of clinical reports and experience I believe Caprokol, in a large majority of cases, is a distinct addition to therapeutic measures heretofore at our command. To obtain the best results the treatment must be persistent and fluid intake moderate, with no soda during course of treatment. The striking improvement in general health and nutrition is often observed in patients taking Caprokol even before any noticeable change has taken place in the urinary tract.

DISCUSSION

Dr. Carl P. Parker, Seaboard: I have used Caprokol in quite a number of cases, but in a large percentage of these cases I seemed to get toxic symptoms. I get nausea, vomiting, cramping pains and diarrhea. In these cases, I always go on the neutral acriflavin. When we do not get results from Caprokol I believe if we will try out the acriflavin for a few days and then probably come back to Caprokol, we shall get speedier and better results.

Dr. John LaB. Ward, Asheville: I can't speak from the standpoint of treatment of adults, as my practice is limited to the treatment of children, and I have not treated a large number with the drug. In the cases of those that I have treated, however, I have gotten to this point in the results: I have gotten brilliant results in one or two cases, particularly in older children, eight or ten years of age. But in the case of infants (and we get most of our cases, of course, during infancy) I find that if you load them up on soda bicarbonate or any other alkali and give an

abundance of water, ninety per cent of them will get well in a very short time; I don't mean cured, because, of course, it recurs. It does the same thing after treatment by Caprokol, for that matter. In infants there are two indications, to me; one is to reduce the high temperature (which is almost invariably a complication of acute pyelitis in infants) and the other is to keep the urine alkaline. I have at present under treatment a case which came to the hospital five days ago with a temperature of 106.5° That is not at all unusual. You find those high temperatures and oftentimes convulsions with pyelitis. I simply put the infant in an evaporation bath of tepid water, 95°, as long as the temperature is up. Sometimes we have to keep them in three or four hours. We load them up on soda and water and give them an appropriate diet, and in 90 per cent of the cases the symptoms disappear in anywhere from five to ten days. Of course, they may recur. That happens in the treatment by any drug, but certainly in the majority of cases you can get the patient back to normal with this treatment.

I think one point which Dr. Justis brought out is worth stressing; and that is the fact that most of these cases have some focus of infection, not infrequently in the tonsils. It is extremely frequent to find tonsillitis preceding pyelitis. It is also extremely frequent to find the focus of infection elsewhere. That means unless this focus of infection is found and cleared out we are going to have recurrence of pyelitis some time or other.

Dr. Justis (closing the discussion): I believe if the gentlemen will use this treatment over a long period of time, they will find it very beneficial. As I said in my paper, the treatment has to be persistent, very often lasting ninety days, before any appreciable results can be obtained. When I have done that, I have found in my very liimted experience, both in the case of adults and children, that I have gotten excellent results with Caprokol.

Unfortunately, the treatment for adults is rather expensive. If you tell the patient that the druggist has to charge $8.50 for one hundred tablets he will throw up his hands in horror; but for children, I am glad to say, the druggist puts it up in about three and a half or four ounce bottles, and it costs about $1.50 or $2.00. I believe firmly that if you persistently treat pyelitis by Caprokol, you can expect in from sixty to ninety days excellent results.

THE SALICYLATE TREATMENT OF ACUTE ARTICULAR RHEUMATISM OR RHEUMATIC FEVER

Carl P. Parker, M.D., Seaboard.

In this outline of a treatment of rheumatic fever I am not trying to bring anything new before the medical profession, but to review the management of a disease which in a large percentage of cases is poorly handled by us, leaving cripples for life as living advertisements of our lack of knowledge and neglect of this malady. I am very much interested in the management and treatment of rheumatic fever; for, as Swift points out, this malady ranks with tuberculosis and syphilis in causing a great economic loss. The disease is time-consuming and comes on in early life when the person is of great benefit to his or her community, 48.68

per cent of the cases occurring between the ages of fifteen and twenty-five years, according to Osler, and the sequelae which remain leave them less productive for life.

Before going into details of the salicylate treatment of rheumatic fever I wish to state that I am not satisfied with their usage and do not consider sodium salicylate a specific, but I can truthfully say that I have obtained better results with the use of sodium salicylate than I have from the other drugs used in the treatment of the above mentioned disease. Needless for me to say that in the treatment of rheumatic fever with whatever drug we may use, the all important thing to do is to find the focus of infection; and nearly all concede that the tonsils are the main source, and these as well as any other foci should receive proper treatment. Removal of the tonsils in the early stage of an acute attack of rheumatic fever has been advised by some clinicians, but from all literature on the subject and personal observation I have not seen where any cases have been benefited. It is a case of procrastination. The door should have been shut before the horse left the stall, so should the tonsils have been removed before the arthritis set in. Local treatment of the tonsils should be carried on daily throughout the entire course of the disease.

I shall not discuss the treatment of the complications of rheumatic fever, as I have not found the salicylates of very much value in these, nor have I seen any case reports in the literature which would warrant their being given a high therapeutic rating in the treatment of any form of carditis, pleurisy or other frequent complications, although Swift points out that the marked anemia attendant with acute articular rheumatism is not so marked where the salicylates are used. He also states that "the fact that following the general use of the salicylates in the treatment of rheumatic fever, fewer patients are seen in an emaciated condition after the subsidence of the acute symptoms is an indication that the harmful effects of the drug are less than those of the virus".

In caring for a case of rheumatic fever one should try and make the patient as comfortable as possible. Cover sufficient to keep the patient warm at all times should be on the bed. Whenever the joint or joints are so painful that cover cannot be allowed to touch them a wire guard should be made or a plaster cast applied. The diet should be liquid and soft and pushed to the tolerance of the stomach, to lessen the attendant anemia. Water should be given in large quantities. The painful joint is bathed with methyl salicylate and olive oil, equal parts, three times daily. Over it a pad of cotton between two layers of flannel is held in place with safety pins. The painful limb should never be allowed to become chilled.

In rheumatic fever we have three predominant symptoms, namely, fever, pain and swelling of the affected joint. To combat these three symptoms sodium salicylate used to the point of tolerance is the drug par excellence that we have at our command at present. In making this statement I realize that I shall probably be challenged by some of my brother practitioners, but I have tried the newer drugs such as atophan, cincophen, oxyl iodid and others, and they do not produce results comparable with sodium salicylate.

Sodium salicylate when given to the point of toxicity quickly reduces the perivascular lymphoid infiltration of the joint, thereby lessening the swelling; pain quickly subsides, and the fever takes a marked drop. In giving the sodium salicylate I always give equal doses of sodium bicarbonate. This lessens the amount of toxicity, prevents an impending acidosis and soothes an irritated stomach. In the treatment of an adult case of acute articular rheumatism I give 15 grains every two hours until point of tolerance is reached. The drug is then stopped for eight to twelve hours. I then start with 15 grains every four hours, gradually reducing the dose as the symptoms abate. I do not discontinue the sodium salicylate for at least two weeks, as relapse is frequently seen especially when the drug is stopped entirely as the symptoms subside. At this point let me say that I do not consider any patient well of rheumatic fever when the predominant symptoms abate or in two weeks thereafter. The patient should be confined to bed for five to six weeks and even longer if cardiac complications occur. Far too many people who have attacks of rheumatic fever are partially crippled for life on account of being turned loose too early.

In following the treatment as outlined the physician must keep in constant touch with the patient and watch for toxic symptoms of sodium salicylate, which are usually nausea and vomiting, ringing in ears, slight delirium and disturbance of vision. All of these symptoms clear up quickly when the drug is withdrawn, but if the patient has dyspnea or collapse occurs, diffusible stimulants, atropin and strychin should be used. In the treatment of acute articular rheumatism a close watch should be kept on the heart, as the most frequent complications occur in this organ and death is practically always due to cardiac failure. I make it a rule to examine the heart daily, whether symptoms point to this organ or not, for any murmers, pericardial rub or myocardial weakness.

SUMMARY

1. Rheumatic fever is a disease which comes on in childhood and early adult life, is time-consuming and in a large percentage of cases leaves people only partially productive for life.

2. Regardless of whatever drug treatment is used in rheumatic fever the focus of infection should be sought for and if found receive proper local treatment.

3. Complications are very frequent and usually of a serious nature and should be looked for daily and receive proper attention.

4. The salicylate treatment of rheumatic fever is not the ideal one on account of having to get the toxic symptoms of the drug to produce results and is of hardly any value in the treatment of the complications, but it is the drug par excellence we have at our command at present.

5. At least five to six weeks in bed should be the outstanding rule in the treatment of every case of rheumatic fever.

DISCUSSION

Dr. L. H. Justis, Littleton: Dr. Parker stated in his paper, I believe, that removing the focus of infection apparently did no good. I have in mind a case now that had acute articular rheumatism, swelling

of joints, and the focus of infection apparently was in the tonsils. The tonsils were removed and apparently so far (that was ten or twelve months ago) the child has entirely recovered. It was not really a child; it was a young man eighteen years old. So I believe that removing the foci of infection is a very important thing that we must take into consideration in treating any acute articular rheumatism.

Dr. W. H. Moore, Wilmington: I have had some very interesting experiences with acute articular rheumatism and some very unpleasant ones. I have a very dear little patient, a friend of my little girl's, who recently suffered from an attack of acute articular rheumatism, and as a result she has a bad heart. We found the focus of infection in the tonsils and removed them, and she has cleared up entirely with the exception of the permanent damage to the valves of the heart. That she will always have and carry with her throughout life, but that has improved very much. She doesn't have the murmer that she did have.

The drug par excellence in this case was sodium salicylate, and I have found that the best way to administer that is to give Burroughs, Wellcome & Company's tabloid sodium salicylate. It is a large wafer, put up fifty in a tube, and the stomach tolerates that better than any preparation I have used. I think you get less unpleasant symptoms from it than from any drug put out, any preparation of that kind, I should say.

I have had many cases of acute articular rheumatism in which oxyliodid compound acted better, apparently, than anything I could find, and I use it frequently; but the real remedy is to find your focus of infection. I believe you always have that, whether it be in the teeth, tonsils, or a cold. You always have a focus of infection in acute articular rheumatism, and I think the thing to do is to remove that.

Dr. W. D. Rodgers, Jr., Warrenton: I have had no experience in the use of oxyliodid. I always prefer to use the established treatment, sodium salicylate. In handling acute articular rheumatism, I search for the focus of infection. The oxyliodid seems to give best results in the treatment of chronic form of arthritis, and the salicylate is reserved for the acute cases.

Dr. O. C. Daniels, Oriental: I am especially interested in the etiology of rheumatic fever, as I am an eye, ear, nose, and throat man. The doctor said that the tonsil is the focus of infection which causes so much acute articular rheumatism. I believe that, and I believe it 100 per cent. I also believe that no man can look into a patient's throat and say whether or not the tonsils are diseased. When I began the practice of eye, ear, nose and throat work, I tried that thing, I tried it diligently to be able to tell the bad from the good. Many times when I thought a throat was good, it was bad; when I thought it was bad, it was bad. So I say no man can tell you that this tonsil is not giving trouble and that one probably is. I think the majority of tonsils are giving trouble. I don't think it would be a mistake at all to remove every pair of tonsils and adenoids. That seems a very radical statement. Of course, there are a few contraindications to removal of tonsils, and only a few, and those are in children. Of course, I wouldn't remove them in a hemophiliac, except under very extreme circumstances. When there are local condi-

tions present, such as abnormally placed blood-vessels, a fellow ought to be careful. That I haven't seen more than once in a practice of thirteen years. So, I say, I would remove all tonsils. With reference to the time for removing tonsils, it is just like removing an appendix. Just as soon as the surgeon makes a diagnosis, he operates. I believe the same thing should apply with reference to removing tonsils. Just as soon as the parents agree to having the tonsils removed, I remove them.

Dr. Parker (closing the discussion): I think that Dr. Justis and Dr. Moore rather misunderstood what I said about removal of the tonsils. When you have a case of acute articular rheumatism, as a usual thing there is a very high fever and there is already infection in your blood and lymph stream. I have seen some tonsils that were removed during that time, but I can not say that removing the tonsils at that time cuts short the attack of rheumatic fever. Yet I am glad that the point was brought out. As soon as the patient gets well enough, I think the tonsils should be removed.

With reference to Dr. Rodgers' discussion of oxyliodid, I have used that a great deal. I have found, though, that oxyliodid gives better results in chronic arthritis cases, far better than you get by its use in the acute form of rheumatic fever.

I am very glad that Dr. Daniels brought out his views as to the tonsils being a focus of infection. I agree with him on that. I believe that in 99.99 per cent of the cases they are the cause of acute rheumatic fever.

TREATMENT OF PNEUMONIA

W. Houston Moore, M.D., Wilmington

Assuming that you have made your diagnosis and your patient has pneumonia, remember, first of all, that you are dealing with a self-limited disease, the outcome of which depends on the virulence of the infection and the resistance of the patient. The virulence of the organism varies in different epidemics, therefore no therapeutic procedure can be considered of definite value until it has been tried in a large series of cases occurring in different epidemics. In this paper we will discuss only those measures which seem to give the most promise of being of definite value in the treatment of pneumonia.

General Measures: The patient should be put to bed and isolated in a large, well ventilated room which has been stripped of all unnecessary furniture and preferably one which permits of plenty of sunshine. A single bed is preferable and should not be placed where a draft will blow on the patient. Windows should be kept open, an abundance of cool fresh air being essential, as it makes breathing easier, furnishes more oxygen, the patient is made more comfortable and mortality is lessened. It is best to have the temperature of the room about sixty degrees, but patients differ with respect to this and their desires should be considered to some extent. In very cold weather there should be enough heat in the room to take the chill out of the air, but one or more windows should be open at all times except during examinations or treatment. There is no value in an icy cold room. If heat is used it should never be from a gas or oil heater. The reason is obvious; they burn up the oxygen and in turn fill the air with carbon dioxid. There should be

enough light weight covering to keep the patient comfortable but never enough to interfere with breathing. Personally, I am opposed to treating pneumonia out of doors in cold weather, but if this is necessary there should be hot water bottles to sides and feet; and the head should be covered and protected from the wind. This can be accomplished by the use of a light blanket or sheet placed over the head of the bed and down the side the wind comes from. All unnecessary exposure should be avoided during examinations, baths, and in changing bedding, etc. Any exertion is injurious. The bedpan and urinal should be used throughout the disease.

Pneumonia is an infectious disease and all necessary precautions should be taken to prevent its spread. All sputum should be collected in paper cups, on paper napkins or gauze and burned. All body linen, clothing and utensils should be sterilized by boiling. The mouth should be kept clean by the use of some mild antiseptic mouthwash, the teeth should be brushed daily and the nostrils should be kept clean. Daily cleaning of the room is essential but should be carried out in such a way as to avoid disturbing the patient and scattering dust. Attendants should practice good personal hygiene and observe the usual precautions taken in the treatment of any infectious disease.

Daily or more frequent examinations of the patient should be made so as to ascertain the extent and progress of the pulmonary lesion, the condition of the circulatory system and the development of complications, etc., as otherwise pleural exudate might be overlooked. Frequent examinations of the urine should be made. The character and quantity of the sputum should be noted. A three-hour chart should be kept and the temperature, pulse and respiration recorded.

Diet: In the acute stage water should be given freely and at frequent intervals. The diet in pneumonia should be principally liquid such as gruels, soups, milk, butter-milk, orange or lemon albumins, broths, etc., given at two or three-hour intervals. The disease is of such short duration that a few days of restricted diet will do no harm. After the crisis a normal diet is most often desired and usually taken without any ill effects.

Purgative: At the onset of the disease a small dose of calomel followed by a purge should be given. Thereafter the bowels should be kept open by a mild laxative or enema.

Symptomatic Treatment: Pain in the chest is best relieved by counter-irritation, and for this purpose the mustard plaster is indispensable. It should be made large enough to cover the chest from the neck to the lower part of the ribs and from side to side and applied to both front and back every three hours and allowed to remain long enough to produce hyperemia. Care should be taken, however, not to blister, as this would prevent further use of the plaster and would cause the patient great discomfort. The hot water bottle is a very good remedy also. In my practice I have discarded all local remedies except the mustard plaster and hot water bottle. If these local remedies fail to relieve the pain it is best then to resort to the use of a hypodermic injection of 1/4 to 1/2 grain of codein or 1/8 grain of morphin.

Chills should be controlled by the use of hotwater bottles, hot blankets and hot drinks such as coffee, ginger tea, etc.

Fever is a manifestation of infection and an evidence of the resistance of the host. It should not be treated except when excessively high; then it should be reduced by a tepid sponge bath followed by an alcohol rub. The tub bath should never be used in adults but is of value in treating children, especially when very toxic or threatened with convulsions. It is well to put mustard in the water, as it produces hyperemia of the skin thereby eliminating body heat more quickly. The use of antipyretic drugs is to be strongly condemned.

Cough, especially in the beginning, is a symptom which serves no useful purpose and should be controlled. Codein sulphate in 1/8 to 1/2 grain doses or morphin sulphate in 1/24 to 1/8 grain doses are the best drugs for this purpose. If the patient is one who is easily nauseated they should be given by hypodermic. In my practice I have found a cough mixture composed of: morphin sulphate, 1 gr.; ammonium carbonate, 2 gr.; ammonium chlorid, 1 dr.; glycerin, 4 dr.; camphorated tincture of opium, 1 oz.; and syrup of tolu, q.s. 3 oz.; given in teaspoonful doses every three hours, to be very effectual. It not only acts as a sedative but as an expectorant as well. The patient coughs less frequently, but when cough does occur it is productive.

Stimulants: Digitalis is the best drug to use as a stimulant to the circulation and should be given from the beginning so as to have the heart thoroughly digitalized in order to carry the strain which is likely to be placed upon it later in the course of the disease. There are a number of good preparations of digitalis on the market, and some are put up for intravenous use, these being of especial value when quick effect is desired. In case of sudden collapse a hypodermic of camphor 3 grains in olive oil should be administered and repeated as often as necessary; or caffein and sodium benzoate in two to four grain doses should be given hypodermically, under the same circumstances. If there is profuse sweating or edema of the lungs at this time, atropin sulphate in doses 1/200 to 1/100 of a grain should be given. It dries up the secretion of both skin and lungs. Strychnin is of no value as a stimulant in pneumonia. Whiskey, brandy, or some form of alcohol is of much value in treating those addicted to its use.

Nervousness and insomnia may be controlled by tepid sponging or by the use of luminal (in 1/2 to 1-1/2 grain doses) and sodium bromid or codein. Delirium is usually quieted by tepid sponging but may require sedatives.

Diuretics: Potassium citrate in 15 grain doses given every three hours acts as a diuretic and protects against acidosis.

Complications should be treated as they arise.

There is no drug of any proven specific value in the treatment of pneumonia. Quinin and its salts have been in use for years and because of its undisputed pneumococcidal powers in the laboratory some claim that it exerts a definite bactericidal action in the body, but this has not been the experience of the majority of doctors. There is one salt of quinin, namely, ethyl-hydrocuprein (optochin or numoquin base, Merk) which does show in high dilution a strongly pneumococcidal power in both the laboratory and experimentally in the blood of animals and human beings. Some observers claim that its early use in pneumonia

does reduce the duration of the disease and will lower the mortality. But its use is attended with some danger and there have been cases of amblyopia reported from its use and in one case total blindness.

The real solution of the pneumonia problem lies first in prevention and, second, in the development of a curative serum. In late years definite advances have been made along this line. There is an antipneumococcus serum that is curative in Type I infections if given within the first forty-eight hours. Lord of Boston reports a series of cases in which the mortality was reduced from 23.4 per cent in controls to 9.5 per cent in cases treated with the serum. The only drawback to the use of this serum is that it is only of value in Type I infections, and outside of hospitals it is not easy to get the sputum typed properly. This diminishes its value for general use by the average practitioner.

There is a polyvalent antipneumococcic solution prepared according to the method of Huntoon and marketed by Mulford, which was first announced in 1919 and does seem to offer hope of a real cure. Cecil of New York reports a reduction of mortality from intravenous injections to almost one half of the control cases. The results are most striking in Types I and IV, but it can be used in all classes of cases. Best results are obtained from early intravenous injection. In the hands of Cecil subcutaneous injections did not produce very marked results. The greatest objection to this method of treatment is the severe reaction sometimes caused when given intravenously, and for this reason it is not more generally used. The antibody solution has proven of greater value than any serum yet developed.

After all the work that has been done experimentally and otherwise, the mortality in pneumonia still remains very high; but by the use of the above methods many cases can be saved that would otherwise die.

DISCUSSION

Dr. Carl P. Parker, Seaboard: There are three things about this paper that struck me very forcibly, the first of which was the temperature of the room. I agree with Dr. Moore heartily that we should not keep a pneumonia patient in a freezing temperature. Neither do I think we should keep a pneumonia patient in a temperature of 70 degrees. The best room temperature that I have found in the treatment of pneumonia is anywhere from 50 to 60 degrees.

The second thing in his paper that struck me forcibly was with reference to the use of the mustard plaster. When I left the hospital and went out in the country to practice medicine, I was told that there wasn't much to the old mustard plaster. I think pneumonia was about the first thing I hit. I didn't use mustard plaster on the old man, and some of the good ladies in the neighborhood said, "Don't you think you had better use a mustard plaster?" I said I wasn't going to use a mustard plaster because it wasn't any good. The patient got worse and worse. They said, "Well, Doctor Squire up here is the best pneumonia doctor around and he always puts a mustard plaster on the first thing."

So this patient died. The second patient I had did the same thing. Since then I have used the mustard plaster, and I shall continue to use it. I do not produce a blister, because if you produce a blister you can't

relieve the pain with another plaster, but if you get the surface of the skin red, it reduces the pain, and when that gets blanched you can put on another plaster if the pain comes back.

Another thing Dr. Moore mentioned was the use of morphin. When you have an adult patient who is taken suddenly with a chill and high fever and severe pain from pneumonia, there is a lot of shock present. I always give a large dose of morphin right in the start, and I have found that this reduces the shock and the pain. The morphin does not have to be given very often thereafter if it is given in large doses at the beginning of the attack.

Dr. G. L. Sikes, Salemburg: I believe most of the gentlemen who have discussed this paper are hospital or city doctors. I want to tell you a little bit about the treatment of pneumonia in the country, where you can't regulate the temperature of the room, and where they don't know anything about a thermometer. You have to keep the room at the very best temperature you can get inexperienced nurses to keep it; you have to get your patient out of the draft, and tell them to keep a moderate fire going in the fire-place or stove, as they may happen to use. That is as near as you can get your temperature to what you want it in the average country home.

But I have found, gentlemen, in my experience of twenty-six years that pneumonia is one of the easiest diseases to treat, provided you are called in at the incipiency of the disease. As Dr. Parker just stated, if you will stay with that patient and get the pain under control (and morphia is a very helpful drug in the beginning), the case can be handled very easily. But I have found that if I leave morphin with the average nurse, in the average country home, it does more harm than good. If you have a trained nurse on the job, it is a great help.

I find, too, that pneumonia is a self-limited disease. It requires a certain time to run its course; and all that the doctor and nurse can do is to help prevent and treat the complications, and make the patient as comfortable as possible, and give him supportive treatment.

I agree with the doctors about the liquid diet and an alcoholic stimulation, if you can get it, instead of strychnin. In the country that is a hard problem to combat, unless you depend on the moonshine preparations, and they might poison your patient and do more harm than good. So we rely practically on the nutritive liquid peptone, the average preparation of which has about eighteen per cent alcohol—and I find that a very helpful supportive means during my pneumonia attacks.

Other than that, I have just one prescription that I have used for fifteen or twenty years that has served me better than any other one prescription that I can use; I have found it uniformly helpful in all these cases. The first part of the prescription is a solution of calcium, which I guess you all know is a chemical combination of creosote and calcium, named Calcreose. The creosote is an antiseptic eliminated in all the secretions. The chemical combination of that with calcium overcomes the irritable effect of the creosote on the stomach. The calcium is a solvent of the tough secretions of the lungs; it helps to liquify those tough secretions and does aid the patient's expectoration; it helps him to shed that tough mucus as no other prescription I ever used will do. I combine

that with another drug that I think a great deal of in pneumonia, and that is ammonium chlorid, which has a similar effect. Then, we all know the beneficial effect of squill in these cases. I add to that syrup of squill. I make my prescription to contain to the gram seven grains of this combined calcium and creosote drug (Calcreose), fifteen minims of the syrup of squill, and five grains of the ammonium chlorid.

There is one other thing that I put in that prescription, which I was about to overlook, that I think is wonderfully helpful and yet objectionable to the patient who takes it, and that is nux vomica. In most of these cases of influenza and pneumonia, the patients have sick stomachs, nausea, and they can't take very much on the stomach without vomiting. But if you put them on this prescription, with the tincture of nux vomica for an adult, twelve minims to the gram, every four hours, you will find that your patient worries you when you go to see him (taking for granted that you have eased his pain with the morphin, to begin with) more than anything else for something to eat; he will complain to you that he is perishing for something to eat, and this helps me in the supportive treatment in the most natural way.

I wish to say that I have tried this prescription twice, personally. I have had influenza and influenza-pneumonia—different attacks and seasons, however. In 1922 I had influenza-pneumonia, and this past winter I had an attack of influenza for two weeks. The worst trouble I had was in not getting enough to eat to satisfy my appetite and not overdo the thing. I was hungry all the time.

You will very soon bring your patient around to health by this supportive means, making him comfortable and giving him a rest. Most of them have a good deal of difficulty in getting the proper amount of rest, which, in my opinion, is as essential as nourishment. I use, very cautiously, a solution of veronal. With this stimulating treatment you give, if you will use that cautiously, you can get your patient to sleep all you want, and it doesn't bind your secretions as do the opiates.

I may be hit for making this remark about veronal, but I have never had a depressed heart from the use of veronal. And you will find that the liquid solution of veronal is much more pleasant and taken more easily than any other preparation that you can use, and you can combine it with any of the other things that you are giving your patient in the form of medicines, adding this veronal to your afternoon medications only.

In addition to this treatment, I give my patients plenty of water, and I think I have a lower mortality among my pneumonia patients than among any other type of case I have treated in the last fifteen years.

Of course, I use mustards. I am a great believer in the mustard plaster. When I can't relieve the pain with mustard, and I have the skin irritated to the proper extent, I direct them to use some simple oil treatment over that area, like camphorated oil; after they have done that, I tell them to use the hot iron over that area of pain and iron that side until it is eased. That is a counter-irritant itself, and if used carefully is a great pain reliever. It helps me wonderfully in bringing my patients around without using a narcotic.

Dr. Ben H. Hackney, Lucama: From my experience in treating pneumonia, I think a close observation of the blood pressure is one of the most important things to note, especially when the diastolic pressure has a tendency to get high. As long as we can keep that low, reasonably low, and keep the pulse pressure from getting too low, I think our mortality in pneumonia among adults will be very much less. When I have a well-trained nurse, I insist on taking the blood pressure at least every eight hours. That, along with these other treatments that have been mentioned (especially rest and more rest, water and more water) are the important things in the management of a case of pneumonia in an adult person.

Dr. F. P. Tucker, Milton: Forty years ago, Dr. John S. Lynch, of the P. & S., claimed to have aborted pneumonia with tincture of veratrum. He was so sure of that and emphasized it so much that the students called him "Dr. Veratrum Viride."

So when I started out, forty years ago, I began to give my patients tincture of veratrum, that is, selected patients; I wouldn't give a baby or an elderly person veratrum. But later the practice changed, and I now give digitalis instead of veratrum. I don't know that I see any difference in results. As a matter of fact, if a patient had a temperature of 104° or 105° and a pulse of 120, 130, or 140, that veratrum would knock it out in an hour or two, and the patient would go into profuse perspiration. Veratrum was continued in such doses as to keep the pulse below 100. Often I saw the pulse reduced to 40 or 50 without doing harm and with seeming benefit. As I say, in recent years, on the theory that the heart is the weakest point in pneumonia and that digitalis tones up the heart, I have given digitalis. I have not given veratrum in thirty years.

Of course, there is a good deal in Dr. Moore's paper about room temperature and things of that sort. That is all taken for granted. I am talking now about the drug treatment. I restrict the drug treatment as far as possible and emphasize nourishment systematically. In addition to milk, soup, and eggs, I often add beef juice—beef peptoids in all serious cases.

Forty years ago, there were two systems or two ideas of treatment of pneumonia in the community where I started. One was veratrum, which I have explained; and the other was quinin and whiskey. I remember the case of a blacksmith in my town who had pneumonia, a regular athlete. His doctor pursued the quinin-and-whiskey treatment in his case, and he was dead in less than five days. As between the whiskey-and-quinin treatment and the veratrum, I prefer the veratrum treatment every time.

I apply local measures according to the indications, according to how much pain there is, and so on. Of course, the high temperature we undertake to control by alcoholic sponging, leaving out the antipyretics. I never give them in cases of pneumonia. But I do give strychnin and digitalis as a routine treatment. As an expectorant I rely on chlorid of ammonia. I would not mix it up with calcium solution or anything else, in accordance with my idea of restricting the amount of drugs to the very

lowest degree and relying on nourishment and general hygienic surroundings. Codein is given for cough and pain. Recently the new drug, "Allonal," has been employed as a hypnotic, as the best sleep producer of that class of drugs.

I treat the disease on the basis that it is self-limiting. I recollect a case that I had, a child a year or two old. I was trying to give her some medicine and I found that she fought the medicine. I got to the point where I set all the drugs upon the mantelpiece and fed the baby. I didn't know what effect that would have on the parents. If I didn't give the baby drugs, I felt they might question the use of my coming to see her. So I put the question up to them as to whether I should continue with the case, and they said yes. So I went there every day. My patient continued taking her nourishment, and the medicine sat up on the mantelpiece; and the case went on to an uneventful recovery in four or five days. So, as between drugs and nourishment, I always take the nourishment.

Dr. J. R. Hester, Knightdale: My favorite method of treating pneumonia has been touched on only by Dr. Moore; that is, serobacterin treatment, and I arise to discuss it only from this standpoint. The serobacterin that I use is put up by Mulford. The directions given with the folder that comes with it recommend that it be given every other day and in very small doses. In the treatment of pneumonia, I give at least a double amount and give it every day. I use two kinds. One is pneumoserobacterin mixed and the other is influenza serobacterin. The influenza serobacterin is used only in those cases in which you suspect, during an epidemic of influenza, that it is an influenza-pneumonia. I mention this fact because in my sixteen years' practice of medicine, my mortality in pneumonia has certainly been reduced at least half. Pneumonia used to be my bugbear. Now I don't fear it, and I have varied my treatment only in regard to the serobacterin. I am a Mulford serobacterin fanatic.

Dr. G. H. Macon, Warrenton: I want to say that I agree with Dr. Moore, who is a better doctor in every way than I am. In regard to stimulation, I don't believe we should stimulate unless stimulation is necessary or indicated. I allow quite a number of my cases to go right on through without stimulation. I believe if we start with digitalis right in the beginning (in other words, if we whip up a horse that is doing the best he can), when the time comes for him to need whipping up, he will be all in and will not respond to stimulants. So I do not believe in stimulation unless stimulants are indicated. In other words, we can not have a routine treatment for pneumonia. Our good friend, whiskey, has been my standby, but unfortunately the State of North Carolina makes no provision for physicians to obtain whiskey in a legal way. So we are compelled to patronize the ignorant bootleggers, the lawbreakers, in order to save human lives. Whiskey should be regulated just as the Government regulates narcotics.

This is a splendid paper, prepared by a man who is thorough in everything he undertakes.

Dr. Moore (closing the discussion): Dr. Parker brought out a point on which I thoroughly agree with him—that is, with reference to morphin in the beginning for severe pain. I think that is a very good addition.

Dr. Sikes spoke of pneumonia being such an easy disease to treat. Pneumonia treated in the home has a very much lower mortality than that treated in the hospital. What the reason is we don't know, but you gentlemen who are accustomed to treating pneumonia at home know that your death rate is lower than those who treat it in the hospitals. That may be one reason why he has had such good success in treating pneumonia.

I am opposed to giving a lot of drugs that there is no definite purpose in giving. I think you should stay away from all the drugs you can unless you have a definite reason for giving them and know that they are going to produce a definite result. He spoke of veronal as being a very good drug to give as a sedative. Well, veronal has been used for a long, long time, and every physician here has no doubt used it, but luminal I think is far superior and is much less depressing. If you combine the luminal sodium with some sodium bromid you certainly will get a sedative effect on a small dose of either. For instance, if you take a mixture of luminal sodium, eight grains, sodium bromid four drams, peppermint water two ounces, in a teaspoonful dose you get a half grain of luminal sodium and fifteen grains of sodium bromid. With that dose you are not going to get depressing effects; you will get a sedative effect. But don't give any more than that.

Dr. Hackney spoke of the taking of the blood pressure as being of so much value in pneumonia. I see no objection to that, and if it is an addition I think it is a good thing to practice. Certainly some good can be obtained from a regular routine of taking it at frequent intervals.

Dr. Tucker spoke of veratrum. I would strongly condemn veratrum in the treatment of pneumonia. I think his idea of restricting the drug treatment is a very good one. I thoroughly agree with him on staying away from all the drugs you can except those that you have a definite purpose in using.

Dr. Hester mentioned the serobacterin treatment. In some cases you will get wonderful results with it, and in some in which I have tried it I thought we got very little result. In cases of influenza-pneumonia you get very good results by this treatment, but in acute lobar pneumonia I don't think it is so effective.

Dr. Justis brought out the alkali treatment. You remember, I mentioned the fact that potassium citrate acts as a diuretic and prevents acidosis. I think giving something along with it is all right, but I don't believe in disturbing the stomach any more than you have to. Soda sometimes causes nausea. If you have an acidosis, I advise giving it. It is probably all right to give it in small doses, but you will occasionally find a patient whom soda disturbs. But alkali treatment is a good thing.

Dr. Macon spoke about staying away from stimulants. Well, digitalis requires a good deal of time to get in its effect; about two days ordinarily is required to get the heart thoroughly digitalized. That persists for about five days. It requires about five drams of the tincture of digitalis to get the heart thoroughly digitalized; and, that being so, you should not wait until your patient needs stimulation to give it. You should begin early enough to get the heart thoroughly digitalized so it will stand the strain that is likely to be placed on it during the crisis.

TREATMENT OF PARESIS AND LOCOMOTOR ATAXIA BY INOCULATION WITH TERTIAN MALARIA

Hubert B. Haywood, Jr., M.D., Raleigh

General paresis is a chronic, progressive, diffuse, structural alteration of the cerebral tissue with involvement of the cortical and meningeal blood- and lymph-vessels, attended by characteristic psychical and motor disturbances. The disease is regarded as incurable and leads to death usually within three years.

No single symptom can be regarded as diagnostic of general paresis, even in the advanced cases. Among the early psychical symptoms are irritability and especially an instability of the moral and mental character. The prevailing character of the psychical manifestations is one of exaltation. It may be a depression, persistent insomnia, recurring hemicrania, loss of consciousness or convulsive seizures. Pupillary changes, as in tabes dorsalis, are often noted ahead of the appearance of general symptoms. Alterations in the deep reflexes are noted. The facial muscles often show signs of involvement; tremors of the muscles of the face and twitchings about the mouth are noted. The speech is altered, being jerky, slow or scanning. Retention of the urine is an early symptom. In the early stages the gait is ataxic or spastic. It is a disease of the middle period of life, from the thirty-fifth to the fiftieth year, on the average, and attacks by preference those in the higher walks of life. Syphilis is regarded by many authorities as the most prominent single cause. Men are attacked three to five times as often as women.

It is quite obvious that little can be done to arrest the course of this disease when once established.

Renewed interest in the treatment of general paresis was stimulated by the work of Professor Wagner Jauregg in the inoculation of patients with the organism of tertian malaria. He had noticed as far back as 1887 that patients with paresis improved following attacks of intercurrent fever, and he chose the organism of tertian malarial fever for experiment because it can be controlled easily. Dr. William A. White, of St. Elizabeth's Hospital in Washington, has tried out this mode of treatment. Written permission to try the treatment on sixty-eight patients was obtained from the families of the patients. It was finally determined to inoculate all of the sixty-eight in order to determine the effect of treatment in cases of every degree of deterioration, with the thought in mind, of course, of the hopelessness of their future status without treatment. Of the sixty-eight, fifty-six were considered to be in sufficiently good condition physically to constitute good risks, and twelve were regarded as poor risks. Of those considered good risks, sixteen are improved, twenty show no change, twelve have deteriorated, six have died, and no information is obtainable in regard to two. Of the poor risks, two are improved, one shows no change, one has deteriorated, seven have died, and no information is obtainable regarding one. Ten cases failed to take malaria; three can not be heard from. At the end of a year, of the fifty-five known cases treated with malaria 32.7 per cent are improved, 38.1 per cent show no change, and 23.6 per cent show deterioration.

Of the treated cases, twenty-seven received antisyphilitic treatment before malarial treatment, three received antisyphilitic treatment after malarial treatment, twenty-two received medication both before and after treatment, and sixteen received no treatment other than the malarial. Of the eighteen improved cases, sixteen had previous antisyphilitic treatment, and eleven of the improved group received subsequent antisyphilitic treatment. Contrary to the experience of some observers, improvement did not occur oftener and to a greater degree in the early cases and those with the least clinical evidence of the disease. Seven improved cases received no other subsequent treatment.

Inoculation is accomplished by injecting two cc. of the donor's blood into the subscapular region of the recipient. The period of incubation varies from seven to thirty-four days. It was decided to let each patient have sixteen to eighteen paroxysms, and this was done in all cases in which the physical condition of the patient would permit it. There were ten failures to show a malarial infection in this group, and in only two cases was there a recurrence of the paroxysms. This is after a year had elapsed. All of the improved cases showed a take.

My experience is limited to one case of cerebrospinal syphilis. The patient had acquired lues in his youth and had had vigorous antileutic treatment for two years. His blood Wassermann remained four plus; he was depressed and melancholy, was losing weight and strength and complained of twichings of the muscles of his face and difficulty of speech at times. There was also slight ataxia. At his request he was inoculated with tertian malaria. The donor's Wassermann was negative. In ten days the patient had a chill followed by fever and ran a regular malarial course, the paroxysms being harder and more prolonged as the disease progressed. He had twelve paroxysms in all. The disease was easily controlled by quinin. In nine months' time he has improved a great deal, has gained in weight and strength and has no complaints. His deep reflexes are still absent, and his blood Wassermann and spinal fluid Wassermann are still positive. He has kept up arsenical and mercurial treatment.

A letter of June 1, 1926, from Dr. George H. Kirby, director of the New York Psychiatric Institute, states that their experience with the malarial treatment convinces them that it gives better results than any treatment hitherto applied in neurosyphilis. He states that he has been able to obtain complete remissions extending over a period of three years in over one-third of the cases of paresis treated. Most of these cases were well advanced in the disease before treatment was instituted. The series of cases of locomotor ataxia has been smaller in number, but in quite a few of these apparently the progress of the disease has been arrested and a great many of the distressing symptoms have been relieved. The pains and ataxia are often markedly improved by the treatment. It is of interest to note that he has kept a strain of parasites going now for over two and a half years by transferring them from one patient to another.

I am drawing on Dr. White's staff for their conclusions: (1) The malarial treatment of paresis apparently produces a larger percentage of improved and arrested cases than other methods of treatment. (2) A

longer period of observation is necessary and a larger number of cases to be treated. (3) This method of treatment, if effective, is easily controlled and with ordinary hospital care should present no serious difficulty nor constitute an unusual risk.

DISCUSSION

Dr. W. Houston Moore, Wilmington: Dr. Haywood touched on some things that I had never heard of, but he brought out one fact that I know is true—that locomotor ataxia is a disease that attacks the upper classes. Why that is so, we do not know. In the upper classes, syphilis attacks the nervous system, the part of the body used most. How many of you ever saw locomotor ataxia in a negro? It attacks the blood vessels of the negro, and they have aneurysms. Why that is we don't know. Angina pectoris is a disease of the upper classes; you seldom if ever see it in the lower classes. Why that is we don't know; but it is true.

Dr. B. J. Lawrence, Raleigh: I should like to ask Dr. Haywood to tell us, when he closes the discussion, if he has any concrete idea as to just what the malaria does in such cases.

Dr. Haywood (closing the discussion): I have no definite explanation as to why the malaria does good in these cases. I have read somewhere that the paroxysms have the effect of breaking down gummatous tissue in the brain, thus giving the arsenicals or mercury, or whatever you are using, a chance to attack the spirochaeta in the blood. Yet they claim as good results for the cases that had no subsequent antisyphilitic treatment as for those that had the treatment. As I said, my experience has been very limited. I did it at the request of this man. I became interested, of course, after that, because he certainly made as much improvement as any one I have seen. In two months' time he gained about fifteen pounds, and he has been a different man in every way since. Immediately after the malaria treatment, his Wassermann was three plus. I had given him pretty vigorous treatment for the period as a whole, with arsenicals and mercury and potassium iodid; and he seemed to be going downhill instead of climbing over the top.

THE ROLE OF INTRAVENOUS GLUCOSE SOLUTION AS A THERAPEUTIC AGENT

J. R. Brewer, B.S., M.D., Roseboro.

Glucose occupies a unique place in the armamentarium of the physician in that it may be used both as a food and as a drug. Glucose is a food par excellence, as it is among the end products of the digestion and assimilation of that great class of foods called carbohydrates. Glucose is a monosaccharid of the formula $C_6H_{12}O_6$, variously designated as dextrose, grape-sugar, or corn-sugar, and is produced readily by the hydrolysis of starch. It represents the form in which carbohydrates circulate in the blood. The value of the glucose sugars has of course been known and appreciated for years, but it is only comparatively recently that glucose has come to be one of the most generally useful therapeutic agents at the command of the physician. A factor for this has been the recognition of the general efficiency of the vein as a medium

of medication and the perfection of the technic of intravenous injection. Therefore, glucose solution for the purposes covered in this discussion is to be given intravenously. Sufficient amounts cannot be given by proctoclysis. The subcutaneus route is not generally useful because of the danger of sloughing if concentrated solutions are employed. The intravenous route is safe, is practically free from pain, the technic is simple, it assures prompt action and possesses the advantage that the dose can be accurately estimated.

The work of Wilder and Sansum of Rush Medical College in the years just before the World War did much to place glucose therapy on a sound and rational basis. They carried out considerable investigation into the problem of glucose tolerance in health and disease and proved by clinical experiment[1] that .8 gram of glucose per kilo of body weight may be injected per hour without causing glycosuria. This knowledge has made it possible to calculate with a degree of accuracy the usual dose required in the average individual and enable us to determine the rapidity and frequency of injection.

Glucose slutions may be employed to furnish fuel to the body. In many cases the patient is unable to take sufficient food and water by mouth and in certain conditions, as in peritonitis, the administration of these substances by mouth is distinctly inadvisable. In these instances the glucose solution furnishes the body with calories and water, and the body metabolism may be kept going with a minimum of loss to the body tissues. As high as twelve to fifteen hundred calories may be given in this manner in the twenty-four hours. If the fluid requirement is high the dilution may be low and 3000 to 4000 cc. of fluid given in this way. The field for the application of glucose solution in disease is wide. The acute infection, in which the patient is unable to take large quantities of fluid or nourishment by mouth, may be greatly benefited by administration of glucose solution by vein. The stomach and impaired digestion are spared and the body is furnished with calories and the fluid requirements are met. Especially in children, dehydration and acidosis may seriously complicate an acute illness; and they can be adequately combated by intravenous glucose solution. Likewise in the wasting diseases and in convalescence from severe illnesses the food requirements over what the stomach can handle may be met by the administration of intravenous glucose. The pediatricians especially make use of this fact in the treatment of athreptic infants. Marriott[2] has stressed particularly the giving of glucose intravenously in treatment of malnourished infants and called attention to the fact that the addition of insulin will insure the complete utilization of the glucose. He advises the use of a 20 per cent solution in the amount of 1/3 to 1/2 ounce per pound of body weight. Titus, Hoffman, Givens, Dieckman, Krebs[3] and others have popularized the treatment of the toxemia of pregnancy by intravenous glucose administration, basing this treatment on the assumption of a marked carbohrydrate deficiency in this condition. They give large amounts in a 10 or 20 per cent solution. O. H. Schwarz[3] has suggested that in the very severe type insulin also be used in conjunction with the glucose, but

Titus[4] has raised the objection that this would burn all the glucose administered and defeat one purpose of the glucose administration, namely: the storage of a supply in the liver as glycogen for later use.

Coincident to the combustion of glucose in the body the fats are burned and acidosis is overcome or prevented. As the ketone acids are oxidized the base with which they are combined is liberated and the $NaHCO_3$ content is restored to the blood plasma. Thus the administration of glucose occupies an important place in the treatment of acidosis of the acetone-body type. Starvation is the most frequent example of this type. It appears that for the oxidation of two molecules of fatty acid there must be the simultaneous oxidation of one molecule of carbohydrate. The store of glycogen may be quickly exhausted by starvation. The acidosis accompanying acute infections, diabetic acidosis and the acidosis of cylic vomiting are illustrative of this type. The effect of glucose on acidosis is made use of by the surgeon to prepare bad risks for operation.

Glucose solutions intravenously enjoy a wide field of usefulness in the treatment of shock from hemorrhage and other causes. In the hemorrhage the fluid level in the blood vessels is raised, and the glucose is stimulating. In shock without hemorrhage there is a loss of blood from the large vessels and a concentration of it in the capillaries. By virtue of its hypertonicity the glucose solution abstracts blood from the tissues, adds fluid and increases blood volume and raises blood pressure. It also stimulates the heart muscle directly. I have seen in cases of hemorrhage and shock the systolic blood pressure fall to 50 and below and promptly rise to 100 or more during the course of the administration of the glucose solution. I know of no more prompt and efficient treatment for shock than the immediate administration of 500 c.c. of a 20 per cent solution of gluoces. It is well in this connection to mention that in a case of shock treated by intravenous glucose administration there is sometimes a moderate fall in the blood pressure following the initial rise. This is probably due to a slight "glucose shock" and is usually of short duration and no significance. The efficacy of glucose in shock may be of decided advantage in the preparation of patients in shock requiring immediate operation. Fisher and Mensing[5] report two striking successes in the preparation of poor surgical risks in acidosis and shock.

The dose of glucose for intravenous injection is usually from 50 to 100 grams for the average adult given three or four times a day. It should vary according to the age and weight of the patient and the indication. Shock and hemorrhage will require only one or two injections and the dilution will depend on the amount of blood loss. In the infections and wasting diseases the dose should be large and repeated three or four times a day. The dilution may vary as to the fluid requirements. Where the patient is able to take some fluid by mouth a 20 per cent solution may be used. If the fluid requirement is high, a 10 per cent solution may be used. In the acute infections with high fever and rapid metabolism considerable quantities of fluid are indicated; and a concentrated solution, if used, should be complemented with normal saline by hypo-

dermoclysis or proctoclysis to bring the total fluid intake up to 4000 or 5000 c.c. in the twenty-four hours, unless the patient is able to take that amount by mouth.

The administration of the solution is important. There are three cardinal rules, which are: Chemically clean infusion sets, maintenance of temperature, and regulation of the speed of injection. Disregard of any one may result in reaction. The temperature at the needle should be between 37-39° C. This is obtained by immersing several coils of the tubing in a pan or flask of water at 43-45° C., and maintaining it throughout the administration. The rate of injection is most important. As before mentioned, .8 gram of glucose per kilo of body weight may be given per hour without causing glycosuria. For intermittent injection this rate may be increased. For example, 500 c.c. of 20 per cent solution may be given over a period of approximately one hour; and the glycosuria, if it does develop, never exceeds 10 to 12 grams. In case the blood sugar is raised above the renal threshold and glycosuria occurs, it is of no special significance. Where large amounts of glucose are to be given, or when, for any reason, the speed of injection must be rapid, insulin may be used to take care of the excess over what the body is able to oxidize. One unit of insulin may be given for every 5 to 10 grams of glucose, or the expected spill over the renal threshold may be estimated and an amount of insulin sufficient to burn this amount of glucose be given at the rate of one unit for each 2.5 to 3 grams of glucose. If the rate of injection is slow, or the amount of glucose small, insulin is unnecessary. It is well never to attempt to burn all the glucose given, for in that instance there would be no glucose for the liver and tissues to store as glycogen for later use.

The preparation of the glucose solution is simple but very important. The glucose used must be chemically pure, the water freshly distilled and the sterilization must be complete. Any C. P. glucose may be used. It need not be anhydrous, although if it is the solution will be clearer. In making up the solution one should know the water content of the glucose and make allowance for it. The water is to be freshly distilled, preferably on the day of preparation. The reason for this is to have a protein-free solution, for many reactions are due to foreign protein. Glassware, etc., is to be washed clean and rinsed in distilled water, the glucose solution filtered into it and stoppered with corks or gauze. Properly prepared solutions will keep for months. I have used solutions more than four months old. Sterilization may be by the autoclave, or if the solution is to be used within twenty-four hours it can be sterilized by boiling for five minutes. On heating the solution becomes acid and some workers have advocated the addition of a buffer salt.[6] If one prefers to buffer, five minims of a fifteen per cent solution of sodium hydrate to 500 c.c. of a ten per cent solution of glucose may be added.

In conclusion, I think it well to call attention to the fact that reactions consisting of shock, chill and fever have been known to follow the intravenous injection of glucose. These are sometimes called "glucose shock." This is a misnomer, as the glucose itself is not at fault, unless the solution has been hypotonic. Intravenous injections of any considerable amount must always be isotonic or above. A five per cent solu-

tion of glucose is isotonic. It is preferable to use hypertonic solutions. The reactions are usually due to an inferior quality of glucose or faulty preparation or technic of injection. The most common cause is the presence of foreign protein material through faulty preparation of the solution. A properly prepared solution from a C. P. glucose, administered in the proper manner with attention to the necessary temperature, will give no reaction.

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DISCUSSION

Dr. Thomas M. Watson, Wilmington: In the treatment of infants and children, we have two types of cases where we feel that glucose administration intravenously is not only indicated but absolutely necessary. The first is in the acutely sick child. Most of those we see at this season are due to upper respiratory infections. That is, we have a well nourished baby who in twenty-four hours after the onset of his upper respiratory infection will lose perhaps a pound in weight. Probably all of that is fluid, and he will develop an acute acidosis. Unless that acidosis is cared for speedily, many of these children will die. As a rule, most of them do, because they vomit and you can't get enough fluid into them by mouth to correct the anhydremia and you can't get enough food to prevent the ketosis.

In these cases, we give intravenous glucose in twenty per cent solution. Most of them are given insulin, a unit to take care of about two grams of glucose, and the great majority of these acute cases don't require glucose more than one time. We can take them on admission, where they have a very marked acidosis, and give it to them at the same rate that we give blood, from ten to twenty c.c. per pound of body weight, and we hardly ever see a severe reaction from it. Once in a while there is a slight elevation of temperature. As far as actual signs of shock go, I remember only one case in the past two years, over at the Babies' Hospital across the Sound, in which we had pretty severe shock about an hour after the administration of the solution, but he came around all right.

In the cases of focal infection you have the same anhydremia and acidosis, in which cases the glucose keeps the babies alive.

We had a case over at the James Walker Hospital, in Wilmington, last winter that came in from Dillon, South Carolina, just as dry as could be. He had a severe acidosis; had been sick only two or three days. We gave him glucose, 200 c.c. (he was a child three years old) and 500 c.c. of saline. His cells couldn't take care of it; it would disappear.

He would have another acidosis, and be dry again in less than twelve hours. We gave him glucose and saline twice a day for about a week, then gave him a blood transfusion, and at the end of the second week he was living, as a result of the glucose, I believe, or the glucose and the blood. I feel sure that he would have died within twenty-four hours if it had not been given. But the anhydremia and the acidosis returned until the focus was finally found, and that was located in the left mastoid. The ear-drum looked perfectly normal. The nose and throat men pronounced it normal and refused to operate for some time, but finally the left mastoid was opened and there was just a drop of pus. After that there was no more acidosis and no more anhydremia; he took his food and made an uneventful recovery.

The other type of case in which it is absolutely necessary, I think, is the case mentioned by Dr. Brewer—the athreptic infant who is starving to death. These infants retain the food they get, but you can't give them enough to meet the calory requirements. If you give them four ounces of any food sugar, such as Karo syrup, dextromaltose, or anything like that, they can't retain it. You can replace this necessary sugar by giving them an ounce, say, in their day's feeding and making it up by glucose intravenously.

We have one baby who hung along on a good high calory feeding, seventy calories to the pound; it hung at a dead level for two weeks. Then we started giving him 100 c.c. of glucose each day, and the day after the glucose was started he gained his first ounce. We gave it every day for seventeen days and he gained from one to five ounces a day. At the end of seventeen days he was to the point where he could take hold of his food, and we increased the sugar in the milk and increased the milk volume, and he came out of the woods.

In both of these types of cases—the acute respiratory infections and the athreptic baby—I don't think there is anything in the world that will take the place of intravenous glucose administration.

I think that line of treatment saves more babies than anything that has been brought out in many years.

THE PNEUMONIA PROBLEM AT THE UNIVERSITY

Eric A. Abernethy, M.D., Chapel Hill

The situation at the University regarding the treatment of the sick is unique in several respects. Practically all of our patients are students whose homes are elsewhere, who are minors, and who do not have any choice in selecting a physician, but have the physician wished on them by the University. Hence the responsibility resting on the University is multifold. Quite often, even in desperate illnesses, the University physician is unable to reach the parent or guardian, or if he does reach them, the parent or guardian is unable to attend the bedside of the patient, and the physician has to assume the role of guardian as well as physician. This added responsibility not only taxes professional skill but often places the physician in a very embarrassing situation. This responsibility is not shirked, and I am privileged to say that the University authorities not only coöperate wholeheartedly but indorse the physician

personally and financially to the fullest extent. Every effort is made to see that each patient is given every possible care regardless of the patient's social or financial standing.

Of all diseases coming under my care pneumonia is regarded as the most serious by both parents and physician. Recently I had occasion to wire a father in another state that his son was in the infirmary with suspected typhoid. The reply was: "Thanks for telegram. Advise if son's mother should come." But always when the message is sent: "John in infirmary with pneumonia. Temperature 104, pulse 110, condition good," the reply comes back: "Secure special nurse. Spare no expense. Leaving at once for the Hill." The word pneumonia strikes a chord of terror approached by no other word.

I want to talk to you briefly about how we handle pneumonia and the results obtained. A discussion of the diagnosis, symptoms and classification of pneumonia is out of place in this paper. The University maintains a 42-bed infirmary, modern and thoroughly equipped with modern laboratories, including x-ray. Two mature experienced graduate nurses are on duty at all times, and special nurses are employed when needed.

Former attempts to classify pneumonias as mild, severe, or desperate have been abandoned, and all pneumonias are considered serious.

Since the opening of the fall term of 1919 approximately one hundred cases of pneumonia have been treated, sixty-eight being patients in the infirmary. I have purposely not included the influenza epidemic of 1918-19, feeling that the unusual conditions prevailing during that period do not warrant classification in this series. Every type of pneumonia from the uncomplicated lobar, involving one lobe of one lung, to the extensive influenza type, involving apparently all of both lungs, was encountered. Involvement of both lungs was noted in forty per cent. of the series, and pleural complications occurred in twenty per cent. Six patients developed pleurisy with effusion, three had empyema, and one had an abscess of the lung, secondary to tonsillectomy. Twelve per cent. were desperately ill, and grave apprehension was felt for six of the cases. At least half the cases exhibited atypical pneumonias, being modified by a definite influenza element. Bloody expectoration was present in over 80 per cent, amounting practically to pulmonary hemorrhage in approximately ten per cent. Sinus disease complicated four cases, mastoid one, malaria ten. Four had organic heart lesions, which in no way affected the course of the disease except to cause anxiety to the attendants. Delirium, from the low muttering type to the wildly excited type, requiring restraint, was observed in twelve per cent of the series. Muttering and talking at random while apparently asleep was noted in approximately thirty per cent.

The duration of the series was from four days to seven weeks, and convalescence was delayed in four over a period of months. There were two deaths, one occurring from encephalitis as a terminal complication during the sixth week, and one (in a case classed as mild) from acute cardiac dilatation four days after the temperature became normal. The remainder of the series completely recovered, including the pleural effusions, the empyemas, and the abscessed lung. Tuberculosis did not occur

in any of the cases as far as could be learned. Twenty per cent were sent home for convalescence and allowed to return to their studies the following session.

Treatment: Routinely the patient was put absolutely to bed and a special nurse or nurses assigned. It is my belief that intelligent nursing is essential in treating the disease. The diet was modified from soft to liquid, depending on the height of the temperature and the individual patient. Fluids, including ginger ale, grape juice, lemonade and orangeade, were given freely. Whiskey was administered to three cases and badly borne by two. One case developing profound shock after the crisis responded to whiskey.

An initial laxative was administered to all of the series. I prefer two old-fashioned compound cathartic pills to calomel and salts, as the saline given after calomel usually produces nausea and often vomiting. A morning sanitary bath was given to all cases except where death seemed imminent. No attempt was made to control the temperature by drugs or baths, but alcohol rubs were used at four-hour intervals where the temperature remained persistently high. Cold packs and ice-bags were not used, except that ice-bags were applied to the head during delirium. The room temperature was maintained at approximately 65° F. An abundance of fresh air was admitted, but in extremely cold weather the air was admitted over warm radiators. No patients were treated outdoors. Regardless of scientific opinion to the contrary, I do not believe that patients accustomed to steam-heated rooms react kindly to extremely cold air. The x-ray was found more satisfactory in confirming diagnoses of fluid than the needle.

Remedies Used: Remedial measures employed were: (1) Circulatory supportives; (2) sedatives; (3) counterirritants; (4) special measures.

1. *Circulatory Supportives.* Digitalis and belladonna were the two main reliances. Digitalis was administered to all cases showing any evidence of pulse flagging. It was administered as the standardized tincture by mouth and hypodermatically and as digifolin. It was given till the patient was digitalized and was used in practically the entire series, given by mouth in twenty to thirty-drop doses every three or four hours till the pulse slowed. In the desperate cases it was administered in surprisingly large doses with satisfactory results, always by needle. Belladonna was given in all cases with the idea that if belladonna will relieve edema of the lungs it must at least limit the amount of fluid exudation in the lung tissue. Very definite diminution of bloody expectoration was observed when the patient was saturated. The tincture was given by mouth in ten- to fifteen-drop doses every four hours, or atropin hypodermically gr. 1/100 every four hours to effect. Blood-pressure was used as a guide in the administration of both drugs. In two desperate cases in which the circulation apparently completely failed, definite results were obtained by the hypodermic exhibition of caffein and sodium benzoate in two grain doses every four hours in conjunction with the other drugs. Camphor, in my experience, is valueless.

2. *Sedatives:* Morphin or some opiate was the main reliance. The relief of pain, to produce sleep and to relieve the patient's anxiety, demands opium in some form. Dover's powders, gr. 5 to 10, codein gr. 1,

by mouth, or morphin gr. 1/8 to 1/6, hypodermically, were used in all cases when indicated. No bad effects were observed from the opiates. Veronal gr. 5 or luminal gr. 1½ was frequently given with the opiate. In the wildly delirious cases chloral, gr. 15-20, combined with bromid, gr. 30, gave satisfactory results, with apparently no depressing effects.

3. *Counter Irritants.* Mustard plasters and dry cupping were used. Mustard plasters were applied over the congested areas from the beginning of the attack in all of the series. In the desperate cases, especially the massive pneumonias, large plasters were used over the entire chest every four hours, alternately at two hour intervals front and back. I am positive that this procedure saved or help save at least two of the cases. I have lived through the oil-silk jacket age, through the antiphlogistine age, through the greased flannel age, and through the so-called pneumonia-cure age, and have found them useless.

4. *Special Measures.* Mild laxatives or enemas as indicated. Oxygen was administered in all the severe types with cyanosis. In those cases in which the cyanosis was due to a massive mechanical pneumonia, oxygen gave definite relief. It decreased the cyanosis and relieved the distress of the patient as an adjunct to the remedies outlined above. In acute heart failure it was of no value. Sera and vaccines: No serum was used in the series. Observation in large clinics did not convince me of the value of any serum up to the present time. Vaccines were used in over half of the series. The ordinary stock vaccine was given in 1½ to 2 c.c. doses at twelve to twenty-four hour intervals, with apparently startling results in about two-thirds of the cases. There was a very definite reaction, manifested by a sudden rise in temperature, followed by a profuse sweat, and a marked drop in the temperature and an apparent amelioration of all the symptoms. This reaction was followed by a definite rise in the temperature and a concurrent rise in the pulse rate, but not to the original height. The vaccine was repeated with the same result. It seemed to me that at least half the cases in which the vaccine was exhibited had an early crisis, the crisis coming on in a number of the cases as early as the fourth day. I am speaking of positively diagnosed pneumonias, and not the so-called abortive types. I have been so favorably impressed by the good results that during the past winter I used vaccines as a routine even in suspected beginning pneumonia. I do not know if any cases were aborted. There were no unfavorable reactions observed. In two desperate cases there was no apparent benefit.

In six severe cases, in which life was despaired of, and in which there was a toxic relaxation of the abdominal contents, resulting in marked distention of the bowel which seriously embarrassed both respiration and heart action, marvelous results were obtained by the procedure used in surgery in such conditions. Eserin, gr. ½; strychnin gr. 1/40, and pitituary extract, 1 to 2 c.c., were given hypodermically every four hours for ten or twelve doses, followed in half an hour by a ss enema. This controlled the marked distention, and was, I believe, instrumental in saving life. Sodium bicarbonate was administered in 1.2 drachm doses in those cases apparently bordering on acidosis. Pleurisy was controlled by dry cupping, followed by strapping, and opium. Pleurisy was regarded as a very serious complication when occurring late in the disease.

No cough syrup or ammonium compounds were used. Creosote carbonate, in five- to ten-drop doses every four hours, was given in some of the series. I do not believe it has any beneficial effect on the lung, but it seems to be an excellent intestinal antiseptic. During convalescence creosote carbonate, combined with two to four gr. doses of ammonium iodid, in an emulsion of petroleum, was given with the hope of hastening resolution. Quinin was given only when there was a definite malarial complication.

Consultations with other physicians were held in more than half the series, usually the family physician if he could be reached, or one or more of the University's medical faculty, or some physician from the nearby cities. Consultations serve three very definite purposes. They are pleasant social functions, are of distinct relief to the family, and are the means of meeting many pleasant and able physicians, thus sealing many friendships. There are times when consultations are of help to the patient.

Summary: (1) Pneumonia is always a serious disease; and any case, no matter how mild, may go to a fatal termination. (2) Pneumonia is never hopeless. Many apparently hopeless cases recover. (3) Eternal vigilance and the help of experienced nurses who have sane judgment offer the patient the one best chance for recovery.

DISCUSSION

Dr. W. C. Byrd, Morrisville: I may have misunderstood Dr. Abernethy, but I understood him to say that he does not use the bath, outside of an alcohol rub; that he considers it contraindicated. What temperature should his patient reach before he considers it useful to use the ice-cap?

Dr. Thomas M. Watson, Wilmington: In the treatment of pneumonia in infants and in childhood, particularly in infancy, we stood off from the intravenous treatment for a long time for fear of overworking the circulation and putting too much weight on the heart when it was already pretty well strained by the toxemia; but we consider now that toxemia strains the heart much more than a little fluid will. We have the same ketosis in the acute pneumonia in infants as we have in the cases mentioned by Dr. Brewer, and we make it a rule to give smaller amounts of glucose solution in the acute pneumonia cases than in acidosis cases due to just upper respiratory infection, acute diarrhea, or athrepsia. But frequently we find that they respond very smoothly to administration of twenty per cent glucose with enough insulin to take care of it. This relieves the ketosis just as it does in the other type of case. Blood transfusion is also a great aid; if it is a child who under ordinary conditions would take a transfusion of 250 c.c., we give him about 100 c.c. and then in about two or three days give him 100 more. We have seen no bad effects from increasing the blood volume and have seen marked effects in the relief of toxemia and acidosis. The administration of intravenous glucose in some way relieves the abdominal distention, which usually gives more trouble in pneumonia in infancy than anything else. I think that is because we give this digestible sugar and leave the carbohydrates out of the diet practically altogether. As a rule, if it is an artificially fed baby, we give him lactic acid milk without any sugar and supply the sugar by the intravenous route.

Dr. J. S. Brewer, Roseboro: I should like to ask Dr. Abernethy what vaccine he uses in pneumonia and if he has had any experience with numoquin base. Last year, out at Barnes Hospital, at St. Louis, I saw some very striking results from the administration of numoquin base in the different stages of acute lobar pneumonia. Many times the temperature would fall to normal on the fourth or fifth day, and the patient would go on to an uneventful recovery. I think it is well worth a trial and should like to know whether Dr. Abernethy has used it. He has a splendid opportunity to formulate statistics on the methods of treatment he uses. The only way we can properly evaluate the newer advances in medicine is by accurately recording events as they occur in the patient and studying a group as a whole. I hope we shall hear more of Dr. Abernethy and his work at Chapel Hill.

Dr. C. A. Street, Winston-Salem: Speaking of numoquin base, I had one case that seemed to be a typical pneumonia. I called it pneumonia, anyway. I had a series in the same locality. I saw this one at 2 a.m., and it was put in the hospital early the same morning. I started him on numoquin base and he cleared up within two days. I said little about it, because I did not know what to think of it; but he was started on numoquin base within ten hours from his first symptoms. When I saw him, he was just as typical a case of pneumonia as I had ever seen; but I got him started right away, and he certainly cleared up. I believe within two days his temperature was normal, and it stayed normal. I didn't see any of the other cases early enough to get them started on the treatment.

Dr. Abernethy (closing the discussion): I regret to say that I have had no experience with numoquin base.

My personal belief, after an experience of twenty-five years' practice of medicine, is that 75 per cent of all pneumonia cases recover without treatment. That leaves about one out of every four to worry over, and 50 per cent of these recover with ordinary care; that is, if just eased along—I don't care what you give them. We used to give ammonium carbonate in 12 to 15 grain doses, which caused acute gastric disturbances. Personally, I don't think it does the patient any good to give any kind of cough syrup in pneumonia. In the first place, pneumonia is just an exudation of fluid into the lung tissues. The patient is going to get well, and you can't make him cough the exudate out. What is the use of punishing these patients by giving them irritating cough mixtures? Make them comfortable and they will probably get well.

I really believe that any kind of a protein given hypodermically is effective; I think you get the same effect from powdered milk or any protein whatever.

Answering the question about vaccines, the one we have used most is Sherman's ordinary stock vaccine in two c.c. doses. I don't think it has any reaction, but I think the protein does give a rapid leukocytosis which apparently limits the duration of the pneumonia. I use it routinely. I just write across the chart, "Vaccine 38 every twelve hours until the order is marked off". And I doubt that the vaccine produces the results; I think it is the protein reaction which gives a rapid

leukocytosis. We have noticed the leukocyte count has jumped from 18,000 to 35,000 within twelve hours after the administration of the vaccine, and we think it is a good thing.

Regarding the temperature, I believe that an average pneumonia case is going to terminate automatically in five to seven or eight or nine days from the onset, and as a rule the temperature will not cause death. I have seen no reason to attempt to control the temperature except in very rare cases.

I remember six or seven years ago at the Post Graduate Hospital in New York, babies were treated on the roof in that mean, nasty, damp temperature of around 16 to 17 degrees above zero. Gentlemen, this is all right, but when you stop to consider that 75 per cent of your pneumonias are going to get well if you don't kill them, and when you stop to consider again that the mortality of pneumonia in your practice is very much lower than it is in hospital practice, why pick up all of these extraneous treatments like outdoor exposition, and all that? You know very well that no patient who is accustomed to a steam-heated room is going to react favorably to a temperature of 16 degrees above zero.

Of all the shocks I have had in my life the most severe was the one I got when I went to France. Those of you who went to France and who saw those people over there probably were shocked the same way. Those people are just as healthy as we are, but, in the first place, there isn't a bathroom in France outside of the modern hotels. In the second place, as far as I could find out, nobody ever takes a bath over there. Certainly the natives don't, because you know France is the largest producer of perfumes and powders of any nation in the world. Those things take the place of the bath, and the native Frenchman never sleeps with his windows open.

What does outdoor treatment mean to any one suffering with pneumonia? Of course, I grant you that after you become accustomed to it you can't breathe comfortably indoors. But I also claim that in the log cabins around Orange County, just as many of our patients get well as get well in hospitals. Fresh air is wonderful. I like it, myself. I take as much of it in every morning as I can. I took some in at six o'clock this morning. But I don't believe that any patient ever got well from pneumonia because he was outdoors. I doubt if any physician who has practiced medicine for any length of time can demonstrate that more pneumonia cases get well outdoors than indoors.

THE SYSTEMIC AND LOCAL TREATMENT OF EXTENSIVE SUPERFICIAL BURNS*

George L. Carrington, M.D., Durham

The treatment of patients with extensive superficial burns has always presented many difficulties and been a matter of considerable interest to the members of the medical profession who have had to deal with them. The immediate effects are often disastrous, and even when the patient has weathered the dangers of an early demise there still remain months and

*Read by title.

often years of constant care in the effort to heal over large granulating wounds, avoid dangerous infection, prevent contractions from scar tissue and obtain good cosmetic results. Frequent as are the reports of grave injuries to children from playing with fire, to adults from accidents in employment, and to all classes from the chances of the every-day walks of life, one seldom realizes what an appalling number of deaths and even greater number of serious injuries occur from burns, until one happens upon statistics that bring home the truth. For instance, in North Carolina during the year 1924 more deaths were caused from burns than from any other accidental cause. Burns caused 343 deaths in that year, with automobiles coming second with 319 deaths.

During the fall of 1921 I had an opportunity to study a number of severely burned patients with Dr. Underhill and others of the Yale Medical School. On November 27 of that year a local theater in New Haven caught fire while filled with spectators, with the result that a large number of people were severely burned. Twenty-one of these were carefully studied in the wards of the New Haven Hospital, with certain findings that have been published, but that seem worth while reviewing here. The fire occurred in the evening. The victims were given first aid dressings and admitted to the wards at once. The next morning systematic blood studies and urinalyses were begun. All urine was saved. Blood samples were taken three times a day at first and later at less frequent intervals. Hemoglobin was determined by the method of Cohen and Smith. Non-protein nitrogen, creatin, creatinin, glucose, urea and chlorids were determined by the methods of Folin and Wu.

The initial hemoglobin findings were surprising, varying from 117 per cent of normal in two less severely burned patients to 209 per cent of normal in one badly burned patient, the average of all cases being 149. These figures will have to be regarded somewhat as approximate, since 110 was arbitrarily taken as normal value as a result of experience with this method of determination. But the point is that there was a concentration of blood in all those severely burned, the degree varying from a moderate to an extraordinary increase. Such an increase in concentration, of course, meant a smaller volume, a less efficient circulation, a dehydrated tissue, and a concentration of waste products and of any hypothetical poison. The cause for the concentration of the blood is readily apparent. The large burned surface meant a large, swollen, irritated, inflamed raw surface. From such a surface fluid simply poured out. The fluid had to come from somewhere, so it came from the blood and no doubt from the undamaged remote tissues as well. It is interesting to note that the hemoglobin findings paralleled the clinical findings and in one case preceded the clinical evidence of a failing organism. On the basis of clinical appearance the patients upon admission were divided into two groups, those dangerously burned and those not so seriously burned. Reference to the table will show that at the time of the first blood examination in the group of clinically dangerously burned the lowest hemoglobin was 137 and the average for this group was 160, while in the less seriously burned group the highest hemoglobin was 136 and the average was 121. The first group ranged from 137 to 209 and the second group from 117 to 136.

Previous experience had shown that an animal could not long survive a blood concentration of 140 and that a concentration of 125 was dangerous. The indication then was apparent—the blood must be diluted. In the normal organism, undamaged, it is a difficult matter to dilute the blood. The excretory apparatus in the normal organism puts out fluid rapidly to maintain a normal concentration. But in such a pathological state fluids may be forced in every way with good results. Hence it is a matter of introducing fluids by mouth, rectum, underneath the skin, the pectorals, the breasts, into the buttocks or into the veins. Such procedures were attended with gratifying improvement in the condition of these patients. The blood became less concentrated, as shown in a falling hemoglobin; poisons were diluted; a failing circulation strengthened; low blood pressures rose; and the kidneys put out a normal urine. Indeed, in only one patient out of the twenty-one that were severely burned did the urine at any time show the presence of albumin.

The question may arise, would not the course have been the same without the forcing of fluids? Would not the body have diluted the blood anyhow? That question appears to be answered by the findings in another victim of the fire who was treated at home without regard to this factor. On the eighth day after the fire this man was unconscious, in collapse following delirium—a typical picture of a toxic, severely burned individual. He had a hemoglobin of 163 and death was expected. Consultation between the physician in charge and Dr. Underhill resulted in the forcing of fluids, beginning with two liters of .7 per cent NaCl solution subcutaneously. A few hours later the patient regained consciousness, became rational and went on to recovery. This man eight days after the accident still had a blood concentration equal to that of many of our patients on the first day, yet as soon as fluids were forced the concentration decreased and the clinical condition improved.

Under such a regime of forced fluids I feel sure that a large number of patients were saved who otherwise would have died. They were kept in better general condition than similarly burned patients without forced fluids, and the common systemic complications were prevented. Of course such treatment would only indirectly tend to lessen the morbidity from pneumonia and serious local infections on the burned areas.

There are other considerations than that of maintaining a proper fluid level in the body tissues and blood, however, that arise in the treatment of extensive burns. The patient when first seen is suffering horrible pain from a sudden extensive accident. He is either badly shocked or else bids soon to become so. Morphin under such conditions is a mercy. The quick application of an occlusive dressing to shut out the air from the exposed nerve endings is also demanded. It is well enough to consider a debridement of the damaged tissues; but usually, while it may be theoretically desirable, it is not a practical procedure to subject such an acutely shocked patient to the anesthetic necessary for the satisfactory carrying out of such a procedure. It is usually a matter of morphin, boric acid ointment, sterile vaselin, carron oil or some other occlusive dressing put on with as much regard for asepsis as possible, and then

bed, with the forcing of fluids by mouth before vomiting begins; and when necessary, fluid by rectum, hypodermoclysis or intraveneously—sometimes by a combination of all.

When the patient has been put to bed, if his temperature be taken it will usually be found subnormal, often by several degrees. This may be attributed to at least two causes; the first being shock and the second being the loss of body heat from the raw surface in the same way that the fluid is lost. Over the damaged area there is no intact skin left to keep in the heat, and the oozing serum acts also as a water cooling system after the same manner as does the sweat. To keep up the body temperature and to facilitate the future treatment of the wounded surface I think that there is nothing better than the blanket tent. This is made by putting blankets over a frame across the bed, usually leaving the patient's head and face out, and then installing a sufficient number of electric lamps beneath the tent to keep the body comfortably warm. Such a tent does away with the painful pressure of covers on the burned surface and makes the nursing care of the patient decidedly simpler.

The later care of a large wound is a matter for considerable thought. The same surgical principles that apply to other wounds are important here. In severe cases there is an extensive superficial wound that is practically sure of infection. Consequently, careful attempts at asepsis should be made from the first. They, however, will not be sufficient, so that antisepsis will have to play a part. It must also be remembered that one of the first principles in the treatment of infected wounds is to secure good drainage. This consideration, to my mind, means that paraffin spray dressings for extensive burns are wrong in principle. They dam back the secretions and the bacterial toxins and so increase the danger to the patient from absorption of these products.

The procedure that we have employed for several years with considerable success is very much that employed by Dr. W. Eslete Lee. It has been based upon the use of the blanket tent, paraffin gauze, dichloramin-T, and baths in sodium bicarbonate water. Some twenty-four or forty-eight hours after the injury, the primary occlusive, greasy dressing is removed. The patient is then kept under the tent without any dressing over the burned area, unless he has been burned so extensively that there is no surface of his body sufficiently intact for him to lie upon constantly with comfort. If he has to lie upon a wounded area we put a paraffin gauze dressing over that area. The paraffin gauze does not adhere to the wound and does not dam back secretions. An ordinary soft gauze dressing and bandages are then applied over the paraffin gauze. The patient is dressed daily, and the wounds are anointed with an oily solution of dichloramin-T. Since the patient is usually quite sensitive to this antiseptic it is necessary to begin with weak concentrations about 1/50%, increasing the strength each day as he will stand it until a strength of about ½% has been reached. When crusts begin to form the patient is given a daily bath in a tub of clean warm water to which a small quantity of sodium bicarbonate has been added. He is allowed to soak in this bath about twenty minutes, at the end of which time the paraffin gauze will usually float off from the areas to which it has been necessary to apply the protective dressing. After the bath the patient

is dried and put back to bed. The dichloramin-T is applied to all the raw surfaces—both those that are to be left entirely exposed and those that are to be covered with the paraffin gauze dressing. For instance, if the abdomen, back and back of arms are burned, the abdomen may be left exposed one day and the back and back of the arms dressed; while at another time the patient may be placed belly down and the dressing applied to the abdomen, while the back and arms are exposed. Such a procedure keeps the surrounding skin healthy, keeps the wound drained and promotes healthy granulations.

During all the course of treatment the possibility of scars and contractures must be kept in mind. The limbs should be maintained in such position as to result in the least possible amount of contracture; and early resorting to skin-grafting—a little at a time, perhaps, but whatever is necessary and possible—to aid in healing, will hasten the time and will do much to lessen or prevent contractures and unsightly scars.

NOMINATION OF CHAIRMAN

On motion of Dr. Eric A. Abernethy, Dr. Ben H. Hackney was nominated for appointment by the president as chairman of the section for the next year.

SECTION ON GYNECOLOGY AND OBSTETRICS

CHAIRMAN: GEORGE H. ROSS, M.D., Durham

CHAIRMAN'S ADDRESS:

CAN WE IMPROVE ON NATURE IN OBSTETRICS: WHEN AND HOW?

GEORGE H. ROSS, M.D., Durham

We have so often heard the phrase repeated: "Let nature take her course" that we have become almost skeptical concerning advancement in obstetrics. We have so often heard labor spoken of as a normal function that we have almost allowed ourselves to believe it to be so. We hardly think of labor as a disease, and yet it is a decided pathologic process. Everything, of course, depends on what we define as normal. Dr. Jos. B. DeLee, of Chicago, says: "If a woman falls on a pitchfork and drives the handle through her perineum, we call that pathologic—abnormal; but if a large baby is driven through the pelvic floor, we say that it is natural, and being natural, that it is normal. If a baby caught its head in a door very lightly, but sufficient to cause cerebral hemorrhage, we would say that it is pathologic; but were that baby's head crushed against a tight pelvic floor, and a hemorrhage in the brain kill it, we call this normal; the function we would say was natural, not pathogenic. In both cases, the pitchfork and the door, the damage is pathogenic, disease-producing; and in the same sense labor is pathogenic, disease-producing; and anything pathogenic is pathologic or abnormal. But you will say the function of labor is normal, and only those cases resulting in disease are abnormal. Labor in nature's intention should be normal, but nature's intention is not conclusive as to nature's result. It sometimes seems that nature intended that womankind should be used up in the process of reproduction, in a manner analogous to that of the salmon, which dies after spawning. Perchance laceration, prolapse and all the evils soon to be mentioned are, in fact, natural to labor and therefore normal. If you adopt this view, I have no ground on which to stand. If, however, you believe a woman should be as anatomically perfect after delivery as before, and that the child should be undamaged, then you will have to agree that labor is pathogenic, because experience has proved these ideal results are of rare occurrence."

Granted that Mother Nature's methods are correct, we must necessarily admit they are far from perfection, when we consider the fact that a small minority escape from damage during labor, while four per cent of the babies are killed and a larger indeterminable number are more or less injured by the direct action of the natural process itself. These natural functions are becoming more or less inefficient in meeting the exigencies of labor as our civilization changes in progression. There are tasks which she could once accomplish unaided that now need and demand our professional assistance. If we admit our inability to assist her in these labors, we should relinquish and deliver the task completely to the midwife.

It is not my purpose in these few minutes to undertake any elaborate discussion of scientific surgical methods in obstetrics, but rather possibly to clarify in the mind of the general practitioner some essential necessities as to when and how we can improve on nature in obstetrics.

Permit me to suggest the three general periods as to when we can effect improvement or render aid to nature in her tasks, namely: first, pregnancy; second, labor; third, the puerperium.

In the first period, namely, pregnancy, there are so many factors that are pathogenic or disease-producing; factors so dangerous and so threatening to both the prospective mother and the expectant offspring from the period of conception that nature begins to make visible her inability to handle the case alone. Here the parturient pilgrim sets out upon a path as difficult and devious as that trod by Bunyan's celebrated travelers. During the first trimester the obstetrician has a two-fold mission of major proportions in helping nature. One is combating the discouragingly obstinate and sometimes fatal early nausea and vomiting. This often tries one's resourcefulness. At times this condition grows so pernicious that we have to interrupt the natural process to save the life of nature's fairest handiwork. The other difficulty is the possibility of miscarriage and abortion. The middle trimester is simply one of stock taking, so to speak; the road is smoother than in the first trimester of pregnancy. Nature needs us here as watchmen, keeping down the weight and getting the bodily system in good repair for the next long climb with its final steep pull. The upgrade of the last trimester is the most trying. A weak myocardium may show signs of weakening on the ascent; kidneys begin to go bad. Paradoxically, the lungs don't stand the rarefied air, and latent lesions spring into activity. The carbohydrate storehouse in the liver may become depleted. The two feared dangers here are hemorrhage and late toxemia; these nature cannot overcome. Woe to the watchman who is asleep to the danger signal of these two insidious blights. We must help nature here and heed her warnings—placenta previa and premature separation cannot be trifled with. Kidney and liver breakdowns cannot be left to nature. We cannot be lulled to sleep by the siren song, "A natural rise in blood pressure", or the familiar stanza, "All women show a trace of albumin," or the sensuous strain which justifies bleeding as nature's handiwork. We must be alert and investigate thoroughly, take frequent soundings and chart out all the hidden rocks and dangers. The wise master knows that nature is a fickle mistress.

Now comes the last long pull—sometimes nature does not pull the occult trigger and we have to induce labor. Once it begins we must stick by our companion. The guide has to take the traveler by the hand, so to speak, and lead along the way. He is on twenty-four hour duty, ever watchful and ever wakeful. In time of storm, the captain must walk the bridge at night, and so it is here. We must not be content to leave nature to herself. However, watchful waiting is often better than meddlesome interference. The obstetrician knows when to and, equally important, when not to. This is the difference between a physician and a midwife.

Coming to the second period—namely, labor—there are three distinct stages when improvement can be made on nature in rendering assistance. Here we see the culmination of all our efforts. Here is an exact proving ground. The results are translated not only in terms of life and death of mother and child but, what is equally as important, in terms of morbidity. The word obstetrician means literally "one who stands in front of", but we should not personify the word—a spectator is not needed, but a wise practitioner is. It is our function to hold out a helping hand and equally our duty to see that it is a strong hand that is offered. When labor begins, we must begin work. The preparation of the patient is most important. Nature will not do this for us. We must see that she is cleansed, shaved and the bowels evacuated. Everything must be in order—we must be cognizant of her exact condition so that the abnormal will be recognized should it develop. Our chief duty is to put the patient's mind at ease—a sympathetic attitude is most gratefully received. Nature seldom blesses her nervous creatures with refreshing sleep, and we must help out by the exhibition of some drug—analgesia, bodily and psychic, is the keynote of the first stage. The fetus requires some attention. The heart sounds and positions noted, often it is possible to improve on the position of the child by manipulations.

In viewing the second stage of labor, we are gazing at a much-fought-over battlefield. Here we find the radicals and conservatives, modernists and fundamentalists. The fact that there is so much discussion and difference of opinion proves that things in this stage are not as they should be. Here is an unsettled issue. Here is one time we do not leave things to nature. If we so much as give a hypodermic or a whiff of ether we are helping and improving on nature. Undoubtedly our first service should be the solution and use of anesthetic. Some have ideal conditions for the "twilight sleep" narcosis—some stick to inhalation anesthesia. The most satisfactory recent addition is probably Gwathmey's rectal instillation method, though sacral block finds many enthusiasts. All methods should be known and used as the need occurs, the proper anesthetic at the proper time.

Often there is a real necessity for mechanical aid—nature has made the demand and the ingenuity of man's mind has met this demand. From the original Chamberlain down to the present time forceps have been made and perfected until we now have a special forceps for every emergency or contingency, with great relief to the mother and no harm to the child. DeLee is the wise and reasonable exponent of prophylactic forceps, and podalic version has recently become popular. This has come about chiefly through the activity of the virile Potter of Buffalo. He has two operations—version and cesarean—and has very accurate data to substantiate his ideas. We may use pituitrin in a limited number of cases, realizing that it may act as a boomerang if we use it inadvertently. Then we must have the ancient method of hysterotomy. This, like other methods, is capable of great abuse. The low cervical cesarean, as advocated by De Lee, is the most noteworthy advance recently. Nature can not duplicate any of these methods, though we sometimes see spontaneous version and occasionally we find nature attempting a spontaneous

cesarean section with rupture of the uterus resulting. The forces of nature are irresistible, and we should take lessons from the other scientists and properly direct her activity.

During the second stage we can be of great help to the child, as frequent auscultation reveals the condition of the fetal circulation. The passage of meconium into the amniotic fluid, except in breech deliveries, is of significance. Nature is giving danger signals, and the wise will heed and give a helping hand. Breech and unusual presentations require additional aid to preserve the life of the child and the health of the mother. In the actual delivery of a normal case there are many details that should be learned to save the mother pain, the child from injury and the perineum from tearing. Resuscitation is an institution established by man and an important one.

Nature still needs us in the third stage to assist her. Any farmer or veterinarian will tell you that animals do not always throw off the afterbirth. All of us have had cases where it was an impossibility to get rid of the placenta without manual and even operative aid. We must help nature with adherent and retained placenta and the more uncommon placenta accreta. Probably the one thing that throws fear and dread into our hearts is hemorrhage—that nightmare of all obstetricians. No matter how ardent a lover of nature a man is, he is grateful for all the outside aid possible in such serious emergencies. At the present time we all recognize and treat lacerations. We don't deliver women under a sheet any longer. Nor can we ostrich-like hide our heads and say we do not get tears, simply because we do not look for them. Nature does not repair lacerations. Most of us recognize the condition of obstetrical shock—pyramided on pain, hemorrhage and prolonged labor. This requires prompt and efficient treatment.

Even when labor is over and we have seen mother and child through the trials and dangers of this event, our task has not been completed. To-day we hear more and more of the importance of the postnatal clinic. The trustworthy physician will not discharge his patient until she is in "status quo" or as near so as is humanly possible. By the simple use of the knee-chest posture and having the patient lie on her abdomen we can reduce the occurrence of retrodisplacements very appreciably. The care of the breasts and the problems of infant feeding all demand our attention and require our aid. Gentlemen, at the present time a competent obstetrician is indispensable. We see need and possibilities for him everywhere. We are not here to displace nature or to doubt her but rather to study, learn, understand, and assist her. The crux of this discourse is in the search for not what nature can endure but what she can accomplish and how we can improve on her in rendering assistance when nature's methods are unable to acomplish her purpose. For experience, if it has taught us anything, has indelibly impressed upon us this lesson: that to allow nature to follow her course unaided means in a good number of cases to let the grim reaper take his toll.

Let nature take her course? Let brutal nature, whose fundamental doctrine is the survival of the fittest, turn back the wheels of human progress a million years to the age of our caveman ancestry? Such a theory is against the fundamental conception of medicine, that profession that is dearest of our hearts.

DISCUSSION

Dr. J. A. Smith, Lexington: Dr. Ross brought out very forcibly the importance, we might say, of prenatal care. I do not feel that we in the South are in need of the prenatal specialist, but I believe that much can be accomplished if each obstetrician will in a way act as his own specialist. I think that much can be done in aiding nature as this paper brings out, by getting the early coöperation of the expectant mother, getting into sympathy with her, getting into personal touch with her, and giving her the special prenatal care that the mother should have. In this way, I think we have the only real means of eliminating the midwife. Show me the county that has a high percentage of midwife deliveries, and I will show you the county that is not doing obstetrics properly. The physicians are not doing their duty. The physicians, then, are repsonsible for the number of midwives and the number of deaths due to their hands.

Dr. Ross touched upon the different methods of delivery. I think personally that this new synergistic method of delivery that has recently come out will prove a godsend to the mothers of North Carolina. The quinaphthol and magnesol in my hands have proved beyond a doubt that there is absolutely no risk, as far as my experience has gone, and I am perfectly sold on that method of delivery. I think the conditions under which you use it and the technic have a lot to do with the results obtained.

Dr. Ross (closing the discussion): There is just one word I want to add: that is, in my mind there are just a few things we should bear in mind when we go to improve on nature in obstetrics. First, we need good training: second, we need experience; third, we need good judgment. Be sure, when we undertake to improve on nature's methods or to assist her in her tasks, that we are able to do so.

THE VAGINA—A SURGICAL OPPORTUNITY

Oren Moore, M.D., F.A.C.S., Charlotte.

It sometimes seems to me that a fair percentage of physicians and surgeons, in their efforts to trace down an elusive diagnosis and often in their attempts to effect a cure in female patients, fail to take advantage of the natural opportuniy furnished by the vagina. Here is an avenue through which much valuable information as to the existing pathology may be obtained and a natural canal by means of which effective surgical entrance or exit may be made.

We do not neglect other cavities and openings in the human anatomy: for example, the internists frequently stress the value of rectal examinations in lower abdominal diagnoses and obscure conditions; and certainly the oral and nasal openings and cavities are more than frequently explored for both diagnosis and cure.

It is a fact that generally speaking the vagina has been left as a sort of private gateway for the gynecologist and the obstetrician, while all others observe a "hands off" attitude which conspires to rob them of a useful procedure.

It is amazing to contemplate the frequency with which men who are doing diseases of women as a specialty discover upon vaginal examination

serious and important conditions which have been completely overlooked or mistaken by otherwise competent medical men and family physicians. This paper, then, is intended to point out a few of the advantages offered for diagnosis and operation by this avenue.

It is perfectly obvious that the great class of diseases which are peculiar to women alone can only be discovered through this channel, and since this group of diseases makes up such a large percentage of feminine pathology, either as the primary or secondary etiological cause, it becomes equally obvious that in this department alone much is overlooked. When we stop to remember that lower abdominal lesions are best palpated through the vagina, then we have included another great class that should be sought for by this route. Again, when we remember the frequency with which diagnoses of retroflexions and antedisplacements are made, and the great stress that is laid upon such misplacements by the general practitioners, as evidenced by the many such cases that are sent in for operation, we are bound to believe that more practice is needed before accurate interpretation of findings is arrived at. In other words, surgeons and gynecologists are frequently called upon to operate for misplacement when either such misplacement cannot be discovered or if present is found to be merely a part of a general visceroptosis and consequently non-operable. All of which tends to prove that vaginal examinations are not done frequently enough in general practice to provide accurate knowledge.

We cannot expect every man in general practice to become expert in all fields, but here is a situation which daily presents itself; and since practice alone is all that is required to produce expert knowledge, one marvels that such knowledge is not more common.

Recently the author was called to operate on an acute abdominal obstruction case in a young woman. The evidences of obstruction were plain; the distended abdomen, the continuous vomiting, the marked collapse, the shrunken facies all completed an unmistakable picture. But following a routine procedure and with the hope of discovering the possible site of obstruction, a vaginal examination was done. To my surprise the finger had scarcely reached the post-vaginal fornix when it encountered a large sausage-shaped knuckle of distended bowel forced down behind the uterus into the cul-de-sac. A gentle push served to dislodge the incarcerated loop and it slid back into its normal habitat. The picture changed with gratifying suddeness; from grave operative risk into smiling well-being was a matter of a few moments. The hazards of operating under conditions of shock were converted into the enviable situation of choosing a favorable later date for surgery.

Many years ago Pryor of New York either introduced or popularized vaginal drainage in pelvic infections and peritonitis. His technic obtained a wide vogue and to my mind is still a most valuable method, although it has been discarded by the majority of operators. To my way of thinking a large per cent of tubal infections, para-uterine abscesses, etc., are best managed by early cul-de-sac drainage. This allows the general involvement which accompanies them to subside and later operation to be done at a favorable time and minus the presence of infection of active type.

In cases of suspected tubal abortion or rupture, when early diagnosis is imperative, a small nick in the cul-de-sac will often furnish the needed bit of evidence in the gush of blood which follows the puncture. It is needless to state that this diagnostic method should not be employed until the surgeon is ready and prepared to follow up the findings with immediate abdominal section.

Deep psoas abscesses have been discovered through this channel, and even Pott's abscess and disease has been diagnosed through the vagina.

Frequently ureteral disease has been found, and it is not unusual for the trained finger to milk the ureter free of a small stone which is blocking its lumen, using the vaginal canal as a means of approach.

Inflammations, discolorations, irritations, etc., of the vaginal mucosa often indicate existing constitutional disease, and such indices are valuable in clinching difficult diagnoses.

Some operators find it possible to do hysterectomies through this canal with better results than through abdominal section, and certainly the vast majority of uterine prolapse and procidentia of bladder and rectum are best approached in this direction.

Lastly I would call attention to the value of routine vaginal examinations in discovering at an early date the evidence of malignancy in the uterus, thereby enabling us to lower the mortality rate of this ghastly disease.

I would like to sum up by saying that is is almost as important to do vaginal examination, visual and bimanual, as it is to examine chests by the stethoscope; that in the vaginal canal nature has presented a valuable avenue of approach to otherwise unapproachable territory; and that practice in doing these examinations is all that is necessary to make the interpretation of one's findings accurate.

DISCUSSION

Dr. J. W. Tankersley, Greensboro: I want to take exception to one thing Dr. Moore said, although I have a very high opinion of his judgment. That is on the value of vaginal hysterectomy. I do it in selected cases, but most vaginal hysterectomy patients are about 75 per cent better than abdominal patients. Of course, they have to be selected cases; that is, where you are sure that you have no abdominal trouble to deal with other than the vaginal condition.

Dr. Moore mentioned routine examinations in those women. Anybody who is a gynecologist and does not make a routine examination of the pelvis is missing one of the best opportunities he has for finding out what is the matter with his patient.

Another thing is this shortening of the ligaments. If you find women with backache and retroflex or anteroflex of the uterus and large cervix, you are going to be disappointed if you think you are going to cure them by shortening the ligaments.

I am not relating my experience. You know you all have had the same experience. You have operated and shortened the ligaments by one of the fifty-seven varieties of operation, and within a month or two the patient is back with the same backache. You haven't helped the patient a bit.

There is one thing you have overlooked, and that is that large hypertrophied cervix, near the glandular tissue, and you see little shining areas throughout the surface. If you stick a knife in them they will ooze a little gelatinous substance. Possibly there will be a little nick in the cervix—not a tear—but those are the cases that are going to continue to have backache after you operate on them. I don't know what there is about the cervix, but I have concluded that there is something about that hypertrophied cervix that causes the difficulty. You have had the experience of examining women, and you will find that in 50 per cent of the cases the uteri are misplaced, that it is a rare thing to find them normal. They are either anteroflexed or retroflexed. Repair the large hypertrophied cervix and let the abdominal section alone. Repair the perineum and you will do more to cure backache than by shortening the ligaments.

There is another thing that Dr. Moore has mentioned that most surgeons neglect and that is one of the finest openings you could have—and that is an incision back of the uterus. I use it in cases of ruptured appendix. The first thing I do is make a Henrotin and put drains in the pelvis. You all know how the pus will accumulate in the case of ruptured appendix. It is hard for water to run uphill, and the same thing is true in this instance; so you put a drain in before you go into the abdomen. Some of the men here have seen me do that operation, not only for diagnostic purposes but for purposes of treatment.

Then there is another thing about the Henrotin incision—this old thing of letting the tubes go till we get pus and the tubes get all matted up with the ovary: once in a great many cases you get a case of a woman with pus in the tubes who bears children, but the number is comparatively negative.

My plan is to operate on those cases before they get into the definite matted adhesions around the pelvis where you have those large pus tubes and ovaries destroyed. I will grant you it takes a little skill in getting the pus tubes through this incision, but it can be done. I frequently have removed the tubes in acute cases, and I very often have them out of bed in a week's time. They are going to become pus tubes if we leave them in, and they will get so they will become matted with the ovary and you are going to lose the ovary along with the tube.

If I can get it in time, I go through the pelvis, make a Henrotin incision behind the uterus, and remove the tubes through this opening. It can be done and is not very difficult.

Dr. Ben F. Royal, Morehead City: The ease with which this procedure can be carried out and the diagnostic facts to be gained are a big temptation to use it, but it is a mistake to think it is too easy. I was in Philadelphia recently, and I saw one of the best surgeons in the city of Philadelphia, in one of the best operating rooms in the world, with all the surgical facilities available, lose a woman from hemorrhage on account of this simple procedure. Just as a word of caution: It is not to be rushed into because of the ease with which it can be performed.

Dr. R. T. Ferguson, Charlotte: The question Dr. Moore was discussing, the subject of pelvic examinations, is certainly a very important one—one that isn't done half often enough. We so often see women who are complaining of obscure symptoms who will tell you they have never had a pelvic examination and have been treated by doctor after doctor.

In the case of an old lacerated and infected cervix with an enlarged uterus the treatment can be carried out in your office. After using local applications for from ten days to two weeks and getting the surface cleaned up, the proper use of the electric cautery will soon effect a cure, and the uterus will return very promptly to nearly its normal size. In this way you will relieve your patient of the constant backache.

There are so many things that can not be found out except by pelvic examination that I do not consider any examination complete without it. I have been doing this work for a long time, and I find there are a great many cases in which you cannot make a diagnosis at the first examination. I have these cases return for repeated examinations before attempting to pass on them, and the more attention you give them the better they are pleased.

I was very much interested in a case recently that was referred to me for examination of the pelvis. There was a distinct mass in the right side connected with the right horn of the uterus. I had the patient return three times for reëxamination to be sure of my position. I advised operation, but as she had been operated on previously in another state by another surgeon she wished to return to him for examination and advice before having anything done. This surgeon told her that all she needed was a curetment, and she had this done. His report of the case was that he curetted a large quantity of debris out of the right horn of the uterus. The patient's symptoms were not relieved, and when she returned to me the mass was still present. This brings me to say that I can not see any sense in curetting a patient when there are no symptoms to justify it. Dilating and curetting the uterus has been greatly overdone. In teaching I emphasize the fact that curetting should never be done except for diagnostic purposes, retained membranes and hemorrhages. Dilating and curetting for sterility is all nonsense unless you have established the fact that the tubes are patent, for these measures are worse than useless where the tubes are closed, besides the dangers and expense connected therewith. It is a waste of time and a waste of the patient's money.

Dr. T. C. Bost, Charlotte: I think we are beginning to realize the importance of doing operations in two stages and doing two comparatively simple operations rather than one that might carry with it undue risk, such as draining the cul-de-sac in abscess formation. But in the discussion, it was advocated that the tubes be removed early in the inflammatory condition. I can't exactly see why that would be advisable, so long as we are taught that some of these infections naturally quiet down and do not require operation, and perhaps in some instances the tubes even function again. Then, too, we know that there is a certain amount of risk of spreading further inflammation if tubes are removed at the height of the inflammatory process.

This point of delaying operation in pelvic inflammation was much emphasized in the last meeting of the clinical congress of surgeons in Philadelphia, pointing out that frequently operations would not be necessary and in event of operation the tendency was to be very conservative in dealing with pelvic organs.

Dr. Moore (closing the discussion): I think it hardly necessary to stress the point Dr. Tankersley made. The round ligaments that Dr.

Tankersley spoke of fall very largely into the same class, I think. It has always been an argument with us that if any really good means of operation were devised there would be no necessity for devising these fifty-seven other means. We don't have fifty-seven means of hysterectomy or removing appendices, or anything else, save the shortening of the round ligaments, showing we are groping very decidedly for something that will hold them up. If the uterus is light enough, and is not borne down, it will stand up under any operation you do. It isn't a choice of operation; it is a choice of uteri.

I further agree with Dr. Tankersley that the majority of retroflexions need no attention, that if it is discovered through accident or by routine examination and you neglect to state to the patient that she has that condition, she goes on just as happily and just as well with our having that knowledge and her not having it. I can not imagine that condition doing any harm unless the uterus is so large and so heavy that drainage is interfered with or it presses on some of the adjacent organs. That is the only indication for the shortening of the ligaments. I think that is generally regarded by men doing pelvic work exclusively as being true.

In the case of inflamed cervix and backache, it seems to me to be a perfectly obvious and emphatic fact that with as much inflammation as a big hypercystic, inflamed cervix contains you would have a definite drainage into glands in the posterior peritoneum and in the broad ligaments. I am perfectly sure that you have found those glands so enlarged, with veil-like adhesions over the tubes and around the ovaries, that they would account for a lot of the pain the patient is having.

I have had poor success with the electric cautery compared to Dr. Ferguson, and I presume it is an error in my technic rather than the efficacy of the method. I have had success with amputation by some of the conservative operations for removal of the gland-bearing portion of the cervix, which in no sense interferes with childbearing or menstruation, and relieves the terrific weight, often as big as the body of the uterus, which when removed immediately arises and no longer causes distress. If nothing else is done, she is relieved of the symptom of leukorrhea and relieved of symptoms on the emotional side. A great many women are relieved of a discharge which offends their esthetic sense and requires them to wear pads all the time.

I think you are right in your statement that 50 per cent of the women who have borne children have a retroflex uterus.

When I said that vaginal hysterectomy was an obsolete operation, I meant anything like regular procedure. The abdomen is the best avenue of approach.

I purposely left out the fact that I have three or four times in a ruptured ectopic used the same opening. In that instance it was readily and easily available for operation, and I decided to go ahead.

I purposely left out of the discussion the ease of the operative procedure through the vagina. I also left out the operations for repair of prolapsed bladder, vaginal plastic operations, the Watkins type of operation for retroflex and descent of the pelvic structure, because they so obviously belong in every man's mind by the vaginal route that I thought I wouldn't bore you by calling attention to those.

Since Dr. Ferguson has talked in such a complimentary way of me, I want further to go on record as complimenting him. I have used the tubes that Dr. Ferguson used in routine. I want to say that the simple use of the apparatus for diagnosis has resulted in four instances of patients becoming pregnant before the next menstruation epoch.

They were very interesting cases. The adhesions in the tube must have been very weak or attenuated in those instances. They went from four to thirteen years without bearing children. I blew out the tubes by the Ferguson method and apparatus. I was perfectly sure I heard air coming through, and four women in the last year became pregnant before the next menses. I heartily recommend the method and think there is no way except through the vaginal route.

Dr. Royal spoke of the fact that puncturing the cul-de-sac sometimes precipitates vaginal crises. That is a danger I have always been on guard for. Before I diagnose a ruptured ectopic by this means I would have every preparation made for a very hurried opening of the abdomen. It may or may not precipitate conditions which are dangerous. I think it is very rare and seldom happens.

Dr. Bost's remarks on removal of the tubes touched on one of the biggest problems in gynecology. The biggest problem in obstetrics is as to when to induce labor. When to remove tubes in the pelvis of the woman is a thing any honest gynecologist or pelvic surgeon finds always on his conscience. We know of cases in which a woman will have severe attacks and in five or ten years bear a perfectly normal child and go through normal pregnancy, showing without doubt those tubes have opened and the patency is restored. On the other hand, if you take out one tube and the other one is good, within two weeks or longer the second tube is gone. So you are caught between the devil and the deep blue sea. If you go into the abdominal pelvis when it is acutely inflamed, the obstructions are such that you are almost bound to take them out. But if you relieve the infection you can go back later.

CRANIAL STRESS DURING LABOR AND ITS RELATION TO INTRACRANIAL BIRTH INJURIES

J. S. Brewer, B.S., M.D., Roseboro.

Since 1917, when Dr. Meigs in her report on maternal mortality made the surprising statement that "15,000 women die annually in the United States from conditions, mostly preventable, caused by childbirth" strenuous efforts have been made toward better care for the pregnant and parturient woman. Medical men have enthusiastically attacked the problem, legislative bodies have legislated and public health agencies have joined to spread the gospel of prenatal and parturient care. Doubtless pregnancy and labor are now less dangerous to the mother than they were a decade ago. But how about the child? How about the danger of birth to the infant? How great is it? Can anything be done to minimize it?

Ehrenfest of St. Louis in his monograph on birth injuries has made the statement[1] that "in at least 40 per cent of autopsies properly performed on stillborn infants and those dying within the first few days

of life intracranial traumatic lesions of some sort are found". Turning to the reports of other investigators I find that his statement is approximately correct. I shall quote briefly a few of those reports which I think will convince you that the journey of the infant through the birth canal is a perilous undertaking and one which demands of the professional attendant during labor a ceaseless vigilance and an exercise of proper judgment that the life of the infant not alone may be saved, but that he may be also saved from a life of imbecility and physical deformity. In a study of 450 autopsies F. L. Adair[2] found four groups: the antepartum, intrapartum, postpartum and neonatal. In the intrapartum group were 75 cases, 28 being premature, of whom 12 died from birth trauma. Forty-seven went to term, and birth trauma was present in 24. There were 27 full term infants in the postpartum group, and 12 showed evidence of birth trauma. The neonatal group consisted of 172 cases, 92 dying on the first day; and of these 67 were premature, birth trauma being found in 37 cases. Of the later-day deaths there were 80 cases, of which 51 were full term; and of these 12 died from birth trauma. Bailey[3] in a study of 100 autopsies at the Manhattan Maternity Hospital found intracranial hemorrhage in 40 cases. Rhodda[4] in a study of a large number of infants dying before birth or soon after at the Newborn Clinic at the University of Minnesota found 50 per cent to have intracranial hemorrhage. Vischer[1] in a study of 186 autopsies on newborn infants up to the age of one month found 74 brain hemorrhages and among them 51 tentorial tears. Of 167 autopsies studied by Eardly Holland[5] 81 cases had torn tentorium cerebelli, associated with subdural hemorrhage in all but 6 cases and with tearing of the falx cerebri in 5 cases. There were 47 cases of breech delivery; and of these 35, or 75 per cent, had tears of the tentorium. Of the 81 cases with tentorial tears 44 were vertex; and of these 25 were forceps delivery and 19 were delivered spontaneously. To determine the frequency of intracranial hemorrhage at birth, routine lumbar puncture was done on a series of newborn infants at City Hospital, Welfare Island[6]. In the first series of 100 infants bloody fluid was obtained in nine cases. Two of these babies died, and necropsy revealed intracranial hemorrhage. It is interesting to note that these nine cases were spontaneous deliveries. In the second series of 100 cases bloody fluid was found in thirteen. There was no mortality in this series. In the third series of 100 cases bloody fluid was obtained in ten cases. There was no death in this series. In the fourth series of 100 cases bloody fluid was obtained in seven. One baby died, and necropsy showed extensive intracranial hemorrhage. To judge from these reports, and they are fairly comprehensive, intracranial injury is present in 40 per cent or more of stillborn infants and those who succumb soon after birth. If we remember that it is estimated that more than 100,000 infants are stillborn in the United States each year, it is an easy matter to appreciate the enormous toll that intracranial birth injury takes in infant life. And according to the statistics from Welfare Island five to ten per cent of those who survive the stress of labor show evidence of intracranial birth trauma.

Now let us consider the mechanics of cranial stress and how it is that excessive stress will produce injury to the intracranial structures. The

fetal head is subject to compression in its passage through the birth canal, caused by the force of the uterus above and the resistance of the pelvic floor below. It is a simple longitudinal compression by opposite forces at each end of the head. It is responsible for alteration in the shape of the head and stretching of the dural septa. It depends on (1) the amount of force, (2) the direction of the force, (3) the degree of plasticity of the head and (4) whether the forces attain their maximum effect gradually or suddenly. Overstretching results in tearing the septa of dura and rupture of blood vessels. It is an evidence of excessive strain. Alteration in the shape of the head is caused by displacement of the bony vault as a whole and partly by bending of the individual bones which compose it. The greatest bending is in the parietal and frontal bones. The effect on the dural septa of alteration in the shape of the head is as follows: the decrease in the anteroposterior diameter of the head by force at opposite ends causes an increase in vertical height and stretches the falx. The falx is anchored to the tentorium and therefore pulls and stretches it. Increase in the anteroposterior diameter of the head occurs when it is compressed between the base of the skull and vault, as in brow and face presentation. The vault becomes flattened, the occipital bones are displaced backwards and the forehead is made protuberant. The greatest strain is on the horizontal part of the tentorium. The dural septa may be regarded as stays to the cranial bones, like stays to a mast. Bending of the bones is resisted by tension of the septa. If it becomes too great the septa tear. Continuance of the pull will cause dangerous disturbance of the cranial contents and possible rupture of the small blood vessels and hemorrhage.

A brief review of the anatomy of the dura will, I think, convince you that the mechanical explanation of dural stress and strain is correct. There are two layers of the dura, an inner and an outer. The outer layer is tough and fibrous, lining the inner surface of the cranial bones. It is really the inner periosteal layer and is the important one in this study. It is channeled by the large venous sinuses and sends into the cranial cavity the septa which Holland[5], Beneke[7] and others believe are purposely developed to enable the cranium and its contents to withstand the effects of stress and strain during labor. When molding of the head occurs tension is thrown on the dura and is along a definite line of stress depending on the presentation of the head, its plasticity and the degree of elasticity of the dural septa. When the molding and consquent tension become excessive, overstretching and tearing of the septa will occur; and the tears will naturally occur along the line of greatest strain. When the tentorium tears the tear will nearly always be found near the line of junction of the falx and tentorium, because this is usually the weakest point. Complete tears will involve both the superficial and deep layers of the tentorium, incomplete tears involving only the superficial layer. Complete tears usually involve the free border of the tentorium, but sometimes the free border is left intact and the tear is in the nature of a perforation. Tears of the tentorium may be unilateral or bilateral. Tearing of the falx is relatively infrequent, because it is the stronger and more elastic of the bands. It is usually found in association with tears of the tentorium.

We now come to a consideration of the hemorrhage. It may be either subdural, subarachnoidal, intraventricular, in the brain substance or in the nature of an epidural hematoma. However, the subdural types are of decidedly greater clinical importance, and in this discussion it is to the supra- and infratentorial subdural hemorrhage that I refer. In contrast to conditions in the adult, in the newborn dural hemorrhages with but rare exceptions are of venous origin. Subdural cerebral hemorrhage may vary from a few drops to a copious hemorrhage. There is no constant relationship between the extent of the tear and the hemorrhage. The hemorrhage does not originate alone from the tear itself. The fact that tears are not infrequently found in which there is no hemorrhage proves this. Likewise hemorrhage without tear is sometimes found, but in this instance the question of hemorrhage diathesis arises. Perhaps moderate stretching with cerebral congestion is sufficient to rupture minute capillaries otherwise inconsequential, but in the presence of a natural tendency to bleed this is enough to produce hemorrhage. It is seldom possible, except when the vein of Galen or other large sinus is torn, to find the exact source of the hemorrhage. The little vessels are so small and delicate and the fine arachnoid tissue surronding them so infiltrated with blood that it is impossible to isolate them with accuracy. Quite apart from the actual process of tearing a small vein or capillary it is necessary to consider the question of engorgement in these cases of excesive strain and molding. With the pulling and stretching no doubt distortion and kinking of the cerebral veins occur, and this increase of the pressure within these vessels may be sufficient to produce rupture. This supposition seems reasonable but must remain problematical, for we cannot measure the pressure within these vessels, neither can we visualize while the process is going on.

What is the actual causation of fetal death in these cases? In cases where there is a large or moderate hemorrhage it is fair to assume that the hemorrhage was the cause. The location of the hemorrhage is perhaps of importance, hemorrhage beneath the tentorium being more dangerous than above it. The septa are not vital structures and are not the source of the hemorrhage. Quite apart from the visible effects of tearing and hemorrhage we have to consider the great rise of intracranial pressure, the evidence of which is not seen postmortem. Perhaps the crowding down of the medulla into the foramen magnum is a factor. In some cases the exact cause of death cannot yet be stated. What is the effect on after life of those who survive? If there has been none or little hemorrhage, probably not much the worse. Precisely what they are can not yet be stated. There is no collected evidence. Yet it appears that certain of the cerebral spastic paralyses are recognized as due to intracranial birth hemorrhage. Maybe in future years many conditions now known as congenital will be proved to be due to unrecognized and untreated intracranial birth trauma.

I have discussed the subject from the anatomy of the cranium and what takes place therein. It now remains for us to consider what relationship outside influences bear upon the production of injury. Mechanical factors are probably always the immediate and direct cause of traumatic injury. Prematurity is an important factor, the skull being

more plastic and the tissues incompletely developed and friable. Syphilis may play some role, but probably a minor one. The character of the labor is important. Molding is a proper and necessary part of labor. It is when it becomes excessive or is accomplished too quickly that harm results. It is a matter of special emphasis that a rigid, incompletely dilated cervix or the rigid perineum of the primipara represent definite mechanical obstacles which may prove a decided influence in intracranial traumatism. It is a matter of conjecture from this point of view what role pituitrin may play. By a dose of pituitrin the head may be forced through an incompletely dilated cervix and pounded against an unyielding perineum. In studying a large number of histories of these cases one cannot fail to notice the frequency with which the administration of pituitrin is mentioned. This might solely express the widespread use of this agent. Perhaps it was indiscriminately and improperly used. Then there is the question of a long, hard, exhausting labor with the head on the perineum for hours. We know that this will increase the engorgement of the intracranial blood vessels and increase intracranial pressure. I am inclined to think that prolonged labor is one of the most important causes in these conditions. Add to this the application of the forceps, perhaps poorly applied, and need we wonder that serious damage is done? It is a matter of question what effect the forceps alone bring. The evidence shows that the incidence is higher in the forceps cases. I feel that other factors are responsible for this, for in most cases the forceps are only used as a last resort after the head has been pounded against the perineum for hours or is applied to a head high in the pelvis after the effort toward descent and rotation has failed. High forceps is a dangerous procedure, and its advisability is doubtful. Of course the forceps are a fatal weapon when clumsily and unintelligently used. There is also the question of breech extraction. The incidence is unusually high in these cases, thirty-five out of forty-seven cases in the series of Eardly Holland. Breech extraction does not allow time for gradual molding of the head. There is a sudden compression and pull on the septa. Potter[8] is everlastingly right in his insistence on plenty of time in delivery of the aftercoming head. An explanation advanced by Wilke[9] and Seitz[10] is that, in the delivery of the aftercoming head, the force with which the occiput is pushed against the symphysis, the cerebellum thus being pushed against the overlying tentorium, may be sufficient to cause its laceration. And in this connection that the force applied to protect the perineum may too strongly press the occiput against the symphysis is mentioned by some writers. It is worth while to note that the quick release of the head as in precipitate labor, pituitrin or a rapid forceps extraction has repeatedly been mentioned in the literature[11]. However, I think the point in this instance is that the quick release was preceded by a quick compression of the head, which is responsible for the damage. And lastly, unskillfulness requires its sacrifice. The unskillful and unintelligent conduct of normal labor has cost many an infant life. Yet it appears that practically without exception every known type of intracranial traumatic lesion has been observed subsequent to so-called normal spontaneous labor.

In conclusion, the matter of prevention requires emphasis. It is largely a matter of expert care for every woman in labor, the exercise of proper judgment on when to interfere and when not to interfere, the cautious use of pituitrin, the timely and skillful application of the forceps in long, hard labors, not allowing the head to be pounded too long against an unyielding perineum, the performance of episiotomy in primiparae, and the attainment of necessary skill before one attempts version. Handle every case with extreme gentleness, especially the operative ones. Be loath to supersede nature, but willing and prepared to act the moment she fails to accomplish her purpose. And finally I want to mention a point which I think is a sociological problem, and it is the cheapness in which human life in infancy is held. I would urge upon you a keen appreciation of the life of the unborn child. Coming into this world as he does without volition of his own, the simplest rudiments of civilized society demand that he be given the opportunity to be safely born. This is a widespread problem and is not alone confined to the profession. There is perhaps less of it in our profession than any other stratum of society. Yet candor forces me to say that there are physicians who in order to shorten the time they spend or through sympathy for the suffering woman will disregard the life of the child and do a manual dilatation of the cervix, even in the primipara, and do a version or forceps delivery and be through in a couple of hours. I have, and expect most of you have, had parents, grandparents and friends insist that I disregard the life of the unborn infant and do a difficult operative delivery when not indicated just in order that time might be saved and they spared a few hours of anxiety. I wonder if it is because many of them are not wanted. It is with the public probably an economic matter. The infant earns nothing and costs much. Of what value is the unborn infant? Thoroughbred horses and cattle are bred only after the most painstaking care, pedigree and all considered. They have a definite economic worth. But the public seems unwilling to go to the trouble and expense to surround the parturient woman with the advantages demanded in an average surgical procedure. It does not seem to be sound economic practice, and human life in infancy remains among the cheapest of commodities.

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DISCUSSION

Dr. J. Buren Sidbury, Wilmington: At the Atlantic City meeting of the American Medical Association in 1925, I was much impressed with the fact that there were three papers read during this session dealing with some phase of intracranial birth injury. This shows that we are waking up to the situation, and also to the responsibility that Dr. Brewer has brought to us: that the unborn child demands the proper care in its entrance into the world.

In the Section on Pediatrics at that meeting, Dr. Grulee read a paper on intracranial hemorrhage of the newborn. His stand was: Within twenty-four hours the damage has been done and why do anything else? Most of the cases I see are probably four to eight months old. The mothers come with the babies because they don't sit up, don't take notice of anything, or don't take the bottle. That is one side of it. Personally, I hate to see a late case of intracranial injury come into my office, because there is so little that can be offered them in the form of relief.

We are gratified to know that the orthopedist is taking more interest and that the neurological surgeon has become interested in this condition, and we hope we are going to be able to offer these unfortunate victims something to hope for in life. Dr. Grulee's position was: Let the baby alone, you will make matters worse if you attempt to do anything; the brain having been damaged, nothing can be accomplished.

Right here I want to cite a case, which I think Dr. Oren Moore delivered in his town. This little fellow represented a definite type of hemorrhagic disease of the newborn. The little fellow was bleeding from every place possible. He had a very definite intracranial hemorrhage. At the first lumbar puncture, one ounce of very bloody spinal fluid was withdrawn. This was repeated daily for five or six days till fluid became clear. He also had four transfusions in six weeks before getting his final start in the world. The little fellow developed rickets and a rachitic spine. He was taken to Dr. Baer, of Baltimore, and he is now recovering from that condition. Dr. Moore, I wish to say Dr. Baer made the statement the other day that this little fellow was mentally the brightest he had ever seen.

You might say this is the exception that proves the rule, but I do not hold to that contention. I feel that so long as there is life, there is hope, and I think that we should, in every case of this condition, have a lumbar puncture done to drain off the free blood if possible. If it can not all be drained off, it will do the baby no harm. I believe that I have a number of babies, who are absolutely normal today as a result of lumber punctures, who would have some defect, probably epileptic, etc., if they had not had this fluid drained off at the onset.

Dr. Brewer cited Dr. Rhodda's statistics on the postmortems under two weeks of life. He showed that fifty per cent of all of these children definitely had hemorrhages, in one or more places in the body, kidney, pericardium, lungs, pleura, peritoneal cavity, and brain. In other words, they represented a definite disease condition known as hemorrhagic disease of the newly-born. They have this tendency for two, three, or four weeks, after which time they become normal as far as blood-coagulation

time is concerned. This condition, with hard labor, or unskillful management, it seems to me, presents a very definite etiological factor and we wonder why more don't have it.

In the James Walker Hospital, we have followed the blood-coagulation time in some two hundred or more cases. Thirty per cent of these cases showed a prolonged bleeding time. Ten per cent of these cases presented definite clinical symptoms of intracranial hemorrhage, either by blood in the spinal fluid, or blood from other sources. This condition, the coagulation and bleeding time, may be normal in the first twenty-four hours.

I had a case I saw with Dr. J. F. Robertson, in which we suspected intracranial hemorrhage. He did a lumbar puncture the first day of life and found no blood in the spinal fluid, the coagulation time being normal. The child gave typical symptoms. He would not nurse, had a feeble cry, began to nurse after forty-eight hours, and nursed well for five days. He then had a convulsion, a bulging fontanel, and the spinal pressure was 8 mm. Hg. but was bloody. The intraventricular pressure was 60 mm. Hg. The coagulation time done at this time was twenty minutes. An autopsy revealed a clot as large as my fist, jammed into the foramen magnum, which was an explanation of the lack of pressure in the spinal canal with increase of pressure in the cranium. We took 40 cc. of bloody spinal fluid from one ventricle and 20 cc. from the other before the baby died. The coagulation time was four minutes, done on the first day of life; on the fifth day of life, the coagulation time was twenty minutes.

Dr. O. L. Miller, Gastonia: I came to this section to hear the reading of this particular paper. In the course of a year at the Orthopedic Hospital at Gastonia I figure we see about 100 or more cases of children crippled from intracranial injury at birth. I estimate that we see an average of two cases a week all the year around. It looks like most of the time it is an intracranial hemorrhage lesion crippling the child. The feeling has been growing on me in the last three or four years that we ought to get out more active propaganda on preventing it; that we ought to have more careful obstetrics, if possible, than is now being done in our state in the interest of the child and the future economic situation. These children are disabled in various degrees and you can anticipate that it will not be long before a movement will be on in the state to institutionalize these helpless children. Should that come about today, you would be amazed at how big an institution would be necessary to take these children out of the families where they are now being cared for, after a fashion.

The parents bring many of these cases to our orthopedic clinics because the babies can't walk or sit up, or if they walk they walk poorly. It was nice of Dr. Brewer to say that the orthopedic surgeons are offering relief, but it is not enough to exclaim over. I want to speak for this end of the management. I think the better future rests in the prevention of the lesion if possible; if not, in the recognition of the intracranial injury early and the draining of the spinal fluid in the hope of lessening the damage. If it can be done, it is certainly a more optimistic thing than to have to trust to what may help them later.

In taking a lot of histories of these injuries, this has struck me from the obstetrical standpoint, that most of the time it is the first child in the family. I suppose, as has been suggested, that it is due to the unusual resistance to the passing of the head in the primipara, and it occurs more often without forceps than with. Most of these patients we see come from the very, very average families—from the textile worker or the poor tenant people.

The next group with this difficulty will usually be along about the fifth to seventh child, and it looks as though a great many cervical tears and resultant scars must have created an unusual resistance against the passing of the head.

The next child we usually see crippled is the eighth or tenth. This appears frequently to be a degenerative condition, due to exhausted state of the mother rather than a true intracranial trauma.

Pituitrin has been used in many cases, but frequently these mothers do not know it. We ask them the question, "Did you get a hypodermic to help you bear the pain?" and they will say, "Yes, I had a hypodermic and the baby came quickly." Then we ask, "Did the doctor come early, or did he have time to stay?" Very frequently they will say, "He came a long way and was in a hurry. I hadn't been in labor long, and he gave me a hypodermic so I could get through quickly." That management seems to have the effect of driving the head down on the cervix before it is properly opened; and it is not practiced, I trust, by the group of men here. It is surely practiced by men who do not frequent this Society and fail to take the subject as seriously as you do. I think that propaganda should be directed against this practice. The thing I see in the future is that the economic care of this unfortunate group of people is going to be tremendous—not mentioning the untold unhappiness of the individual child and its family.

I appreciate very much the privilege of discussing this paper and want to indorse the essayist's position on the subject. I do think that we ought to take this situation to heart very seriously and create all the propaganda we can in the interest of having our pediatrists or neurologists or other men consult in regard to the draining of the spinal canal in injured cases rather than wait and hope for help from orthopedic sources.

Dr. W. P. Knight, Greensboro: The gentleman has said that we should use greater care in obstetrics, but he did not say how. When you say that more should be done, you should tell us what we should do. We want something specific given us so we can put it into practice.

Dr. Ivan Procter, Raleigh: I am glad that Dr. Knight said that, because I was coming to the rescue of the obstetrician. Although he didn't stress it, Dr. Miller in his talk said there are more cases of hemorrhage in the patients who are delivered without than those delivered with forceps. Dr. Sharp demonstrated that in his first 100 cases. He took his first 100 normal labors and tapped the spine of each baby, and he found blood in the spinal fluid in nine out of one hundred cases.

It doesn't seem to me that it is altogether poor obstetrics. I don't think it is, because that fact alone shows we are getting hemorrhage in a large number of normal babies, many of these, I believe, taking care of themselves. In other cases—you have seen it, and I have seen it—of

hard forceps operations the babies come out with distinct scars, in a number of cases with facial paralysis but no signs of cerebral hemorrhage. In other instances there is a perfectly normal delivery. The baby, however, twenty-four hours later has convulsions and if you don't drain the spine you will have one of these crippled imbeciles Doctor Miller speaks of. So I don't think it is entirely poor obstetrics. I think, however, we can improve on our work in a number of ways.

There is one point I want to bring to your attention, and that is post-maturity. I strongly believe in that mooted question; some men don't believe in post-maturity. I have seen it. I believe that many babies are overdeveloped, with an increase in weight and size; and head diameter, when compared with the size of the birth canal, shows a disproportion. The maternal pelvis may be perfectly normal, may be larger than normal, but if there is an abnormal increase in the size of the baby the difficulty in passage will be just as great as if the pelvis were markedly contracted.

Therefore, I believe we should study and pay attention to our cases as they are traveling along the latter part of pregnancy, estimating the weight of the child and measuring its size. In that way we can acquire knowledge of just how much or approximately how much the baby weighs so that we may know when to induce labor in the mother. We will not have to accept the patient's estimate as to the time for delivery. Calculation from the last period, as we all know, is very inaccurate and may permit a patient to go overtime and develop a post-mature baby. I think that is a very important thing. I think that the obstetrician should study and estimate the size of the child, and if the woman goes beyond maturity, he should induce labor. That will reduce the number of cerebral hemorrhages.

Dr. Jos. Akerman, Augusta, Ga.: Two points interested me very much in this discussion of the use of pituitrin. I think the danger of pituitrin is something that ought to be stressed. Another point that I think we ought to make is that there has been too much misunderstanding between the obstetrician and the pediatrician. The pediatrician has been inclined to abuse the obstetrician because he thinks a great many cases are due to forceps and some due to lack of forceps. On the other hand, the obstetrician doesn't know enough pediatrics to begin with and, in the second, is not willing to admit his ignorance. In the University Hospital at Augusta there is coöperation between the pediatrician and myself. We make it a rule that the pediatrician is requested to see each new-born child and make a thorough examination of that child and do what he thinks is necessary. It is a responsibility that we are very glad to delegate and a responsibility that they are very happy to assume. I think that the whole thing would be very greatly improved if the obstetrician and the pediatrician would have this arrangement.

One thing that I think is quite important in those cases, which hasn't been brought out, is giving after the baby is born, if you are suspicious of some intracranial hemorrhage, about 20 cc. of the mother's blood subcutaneously every eight hours for three or four injections and follow that up with your spinal puncture.

Dr. Brewer (closing the discussion): I see already that you appreciate this condition. If you appreciate it, you are going to be careful, and if you are careful you are not going to get many of these conditions to deal with. You must remember that intracranial hemorrhage is sometimes seen in so-called normal spontaneous labor. But I believe in most of these instances if you will do a bleeding and clotting time you will find it will reveal a case of hemorrhagic disease of the new-born, and that this condition with probably a moderate amount of cerebral congestion has been sufficient to cause the hemorrhage. This is especially true of the premature infant.

There are lots of things we can do, generally speaking, to be careful. One is the question of pituitrin. We are familiar with its action on the uterus, but what effect does it have on the child in utero? Has it any effect? I don't know. Does anybody know? Yet it may have some effect. Remember that the incidence is higher when pituitrin is used. The condition of the cervix is especially important if one is going to use pituitrin. Suppose the cervix is not sufficiently dilated or is fibrous. Then you have a head being pounded against an unyielding tissue and stretching and tearing of the dural septa may result. It is when the molding takes place suddenly and the head is rapidly pushed through the cervix and over the perineum that the greatest danger arises. If the molding of the head is gradual the dural septa will stretch and will not tear. That explains why in many cases after a long hard labor when the head is on the perineum and the obstetrician applies the forceps and completes the delivery he is surprised to find that the baby is all right. He has allowed sufficient time for molding.

The question of post-maturity was mentioned by Dr. Procter. No doubt that is a factor in many cases. It was in the specimen I have just shown you. Prenatal care and the timely induction of labor will save many cases that would otherwise go on to post-maturity and difficult labor.

There is another point I want to stress. In the case of breech delivery, don't jerk the head out of the pelvis as soon as the shoulders show, but give a little time. You have not the time in the breech as in the vertex case for the head to change its shape to fit the pelvis, and if you jerk it through there is a sudden tension on the dural septa which may result in tear and hemorrhage.

I am glad Dr. Spicer mentioned watching the fetal heart sounds. That is one of the best ways of knowing when to interfere.

FURTHER OBSERVATIONS ON THE PREVENTION OF ECLAMPSIA

Ivan Procter, M.D., Raleigh

For years I have heard paper after paper read at medical societies dwelling at length upon the treatment of eclampsia, but rarely giving any time to what we consider the vastly more important part of the disease—that is, the recognition and proper treatment of preëclampsia. We have tried to bring to your attention some of our clinical observations on the prevention of eclampsia rather than its treatment, for all treatment has largely proven a failure. Physicians the world over treat this dread-

ful disease by both radical and conservative measures, by various and sundry methods, but each and every treatment has its high mortality rate. Prenatal care in the last few years has done much to reduce the number of cases of convulsions. At the Long Island College Hospital, only one patient out of a thousand prenatal cases developed a convulsion. One of our patients out of five hundred prenatal cases developed a convulsion. The great difficulty with prenatal care is the lack of universal application. Physicians have difficulty in carrying it out, and patients either ignore or do not know its importance.

Toxemia of pregnancy occurs in approximately 6½ per cent of all cases, and convulsions develop in slightly less than one per cent. This percentage is certainly great enough to demand careful observation of every pregnant woman.

The symptoms and signs of the pre-eclamptic state are usually very definite, and easily recognized by the trained observer. The important thing is for us to make careful observation of each patient and fully investigate any suggestion of approaching toxemia. For seven years we have spent most of our study on three obstetric problems: First, the elimination of the unnecessary pain of labor. Second, the proper use of pelvimetry in order to reduce the fetal mortality and indications for cesarean section. Thirdly, the recognition and treatment of the pre-eclamptic state. The latter probably is the most important of them all. We feel sure that it offers the greatest field for good. Every physician can recognize the pre-eclamptic state, and the treatment necessary to prevent convulsions is usually simple. If a woman in the second or third trimester of pregnancy begins to suffer with headache, slight nausea, restlessness, insomnia, increase in weight, decrease in urine, albuminuria slight or marked, and especially if there be a gradual or sudden rise in systolic blood pressure, we have a condition demanding careful, immediate, and ofttimes radical attention. Such a woman is in the pre-eclamptic state and she deserves every safeguard that can be thrown about her. It is not necessary to have all of these symptoms to make the diagnosis, for a gradual rise in blood pressure alone indicates approaching trouble. Often albuminuria and edema are not present until convulsions are inevitable or have already developed. When the toxemia reaches this degree, the indications for treatment have changed and mortality risk has jumped from around one per cent to fifteen or twenty per cent. The financial obligations are immediately increased tenfold because the best hospital, obstetrical and often surgical treatment must be had without considering cost, whereas if treatment is begun in the earlier stage it can frequently be carried out at home by the family physician.

Persistent high blood pressure usually means renal insufficiency and this is frequently first indicated in the retina. The use of the ophthalmoscope in the nephritic type of cases is valuable in detecting positive signs of approaching toxemia before the usual symptoms appear.

When a patient has placed herself under our care she has lifted a great burden of responsibility from her own shoulders and placed it upon her physician. After we have explained in detail the importance of prenatal care and attention, we have the right to demand the fullest cooperation of the patient. If they ignore this demand, we have the right

to resign from the case, hoping to teach them a lesson. Such action on our part will not react against us but will help to teach the public that we are conscientious in our work and that they must coöperate to the fullest.

Rural physicians who cannot visit their patients frequently could often prevent a calamity by sending them to a hospital for observation. This need not be prolonged if the patient is in the eighth or ninth month, when pregnancy can usually be terminated without danger to the child. If the pre-eclampsia has developed in the fifth, sixth, or seventh month, the prognosis for the child is so grave that observation need not be prolonged provided the patient's condition resists ordinary treatment or recurs after improvement.

Induction of labor is rational treatment in the pre-eclamptic state but is not necessarily so after convulsions have begun. Pregnancy is the direct or indirect cause of eclampsia, hence its elimination should prevent the disease. But, like tetanus, the cause must be eliminated before the disease is established. When both tetanus and eclampsia are well established the toxins become so firmly fixed to the central nervous system that neither anti-tetanic serum nor the termination of pregnancy can break them loose.

Every obstetric patient is a potential case of eclampsia. Our policy is to work with this fact always in view. Prenatal care is begun by giving the patient a thorough and complete physical examination at her first visit. This establishes confidence and a foundation for any treatment to follow. During the examination we make a thorough search for foci of infection in the teeth, gums, tonsils, nose, pelvis of the kidney, *et cetera,* proper steps being taken to eradicate any foci found. The hemoglobin is taken, and if indicated a Wassermann is done. Internal and external pelvic measurements are made. The weight and blood pressure are recorded; the history of previous diseases, especially those that are destructive to the kidney cells, is noted; the menstrual and marital history are taken, and the general history of the husband is inquired into. The patient is instructed to measure the amount of urine voided in twenty-four hours, and send a four ounce specimen for examination. The twenty-four hour amount is measured each month throughout the pregnancy. The patient reports every three weeks until the fourth month, and thereafter every two weeks. During the two week visit periods, a specimen is sent every alternate week so that every seven days the urinalysis is made or the blood pressure is taken. During the last month both examinations are made weekly.

Throughout the prenatal period the patient is interrogated as to headache, nausea, dizziness, restlessness, irritability, insomnia, spots before the eyes and edema. If any of these signs are present it may be necessary to make the observation more frequent. A rising blood pressure is probably the most important sign of toxemia. Any gradual or sudden rise in blood pressure during the last half of pregnancy should be considered a danger signal. Preventive treatment should be instituted at the first warning. If other symptoms such as headache and nausea are present, the treatment should be more active. When the blood pressure goes to 150 systolic, it has reached the danger point.

Rest is the foundation of all treatment, rest for the body, and for the kidneys and liver. Patients will not completely rest on being told to lie down a part of the day, so it is the best policy to put them to bed. Milk should make up the greater part of the diet. Elimination is increased by mild purgation and flushing the kidneys by large quantities of water. An abundance of fresh air is provided. If the blood pressure falls and the symptoms disappear, the patient is allowed to get up. If the pressure does not fall and the symptoms persist, the diet is restricted even to starvation. If the pressure continues to rise in spite of starvation, elimination and absolute rest in bed, induction of labor is indicated. Herein lies the secret of preventing eclampsia. If a pre-eclamptic patient after absolute rest in bed on milk diet and free elimination continues with a high or rising blood pressure, if the urine repeatedly shows albumin or casts, if the retinitis is persistent or progressive, the pregnancy should be terminated at once.

We wish to report on the twenty-five cases of toxemia of pregnancy found on reviewing three hundred and nineteen consecutive obstetric records, referred cases not included. One case was eclampsia proper. Twenty-four did not progress beyond the pre-eclamptic state. The patient with convulsions was examined forty-eight hours prior to her attack, the blood pressure being 135 systolic, the urine free from albumin and casts. The following day, however, she took a long open automobile ride in a cold rain. The typical severe headache began twelve hours later, and convulsions soon followed. Labor was induced and a six and one-half months living fetus was delivered. The patient reacted to treatment but immediately on regaining consciousness showed signs of lobar pneumonia. Her convalescence was necessarily prolonged but she was finally discharged in good condition. The baby lived seven hours.

The duration of pregnancy in the twenty-five patients ranged between six and nine months. Fourteen patients began their pre-eclamptic symptoms in the eighth month. All patients developed symptoms ante-partum. Thirteen patients were primiparas; twelve had from one to nine pregnancies. Seventeen patients showed gradual rise in blood pressure, while the pressure rose suddenly in only eight. Albumin was present in twenty-two; albumin and casts in eight; edema present in fifteen. Twenty patients were treated by absolute rest in bed on milk diet. Seven received temporary relief, six permanent. Labor was induced fourteen times with no maternal mortality, and the loss of three infants. There was no fetal death, however, after the seventh month of pregnancy.

CASE REPORTS

Mrs. A. A. C., December 13, 1923. Age 39. Para 0. Duration of pregnancy six weeks. Faint trace of albumin present. Blood pressure 130, June 6th. Albumin increasing. Pressure 150. Patient put to bed on milk diet. Pressure down in a few days to 120. July 1, trace of albumin and edema of ankles. July 11, pressure 170 systolic, 105 diastolic. Sent to the hospital for observation. July 16, induction of labor by packing lower uterine segment and cervical canal. Cervix rigid. After dilatation was complete, forceps delivery. One hour following labor the pressure had dropped to 135. Mother and baby discharged in good condition two weeks later.

Mrs. O. W. H. Age 32. May 7, 1925. Para 0. Justo-minor pelvis. Pressure 110. Duration of pregnancy six weeks. September 1, albumin present. October 1, pressure 160. Patient put to bed on milk diet. Blood pressure reduced 35 points in three days. Weight reduced five pounds. Immediately after getting out of bed pressure rose to 160. Following day 190. For thirty days the pressure ranged between 140 and 160, the patient remaining the entire time in bed on milk diet. Starvation, purgation and elimination, all failed to reduce the pressure. Albumin was constant in small quantity. Granular casts appeared. November 12, induction of labor. Three-pound stillborn fetus delivered. Pressure dropped to normal within twelve hours, and albumin disappeared. Patient discharged in good condition two weeks later. This case well illustrates the futility of trying to carry to term a patient suffering with toxemia. The fetus runs a high mortality risk; the kidneys are damaged, and the patient's life is in great danger.

Mrs. G. M. N. Age 36. Married 9 years. Para 5. Two miscarriages, one ectopic. First labor persistent occiput posterior terminated by version. Second pregnancy terminated by induction on account of toxemia. February 5, 1925, pregnancy, six weeks duration. Albumin present. Blood pressure 130. General physical condition good. August 29, blood pressure 150. Patient put to bed on milk diet. Pressure dropped five points but soon rose to 175. Severe headache. Patient again put to bed, all foods restricted. In twenty-four hours pressure down to 146, headache relieved. September 9, discharged after a five day stay in the hospital much improved. Two days later pressure 160. Patient put to bed for five days. September 16, pressure 145. September 19, admitted to hospital. Castor oil and quinin failed to induce labor. No. 5 Voorhees bag inserted. Forceps delivery. Albumin and casts disappeared, pressure dropped in twenty-four hours to normal and remained there. Mother and baby discharged in good condition ten days post-partum.

In conclusion, if every physician would take a personal interest in teaching his patients and the public as a whole the necessity for pregnant women visiting their physicians at regular frequent intervals throughout gestation; acquainting them with pre-eclamptic symptoms and signs, and insisting upon these being reported as soon as they make their appearance, we would render a service of unlimited good.

If, after a pre-eclamptic patient has been treated by absolute rest in bed, milk diet, and elimination, the symptoms and signs of toxemia persist, labor should be induced at once. Such treatment will greatly lower the morbidity and mortality of eclampsia.

SUMMARY OF CASE REPORTS

Number of patients	25
Age: Youngest, 21. Oldest, 39.	
Number between twenty to twenty-five years	6
Number between twenty-five to thirty years	8
Number between thirty and thirty-five years	5
Number between thirty-five to forty years	6
Number of previous pregnancies	
No pregnancies	13
One pregnancy	3
Two pregnancies	3

Four pregnancies	1
Five pregnancies	2
Eight pregnancies	2
Nine pregnancies	1

DURATION OF PREGNANCY

Six months	4
Seven months	4
Eight months	14
Nine months	3
Pre-eclamptic symptoms developed in all patients ante-partum.	
Gradual rise in blood pressure	17
Sudden rise in blood pressure	8
Patients with albumin and casts	9
Patients with albumin	22
Patients with edema	15
Number treated by rest in bed and milk diet	2
Number in bed seven days	7
Number in bed one to fourteen days	10
Number in bed thirty days	3
Temporary relief by rest and diet	7
Permanent relief	5
Permanent relief by induction of labor	14
Induction of labor by castor oil and quinin	7
Successful in 5. Failed in 2.	
Induction by Voorhees bag	8
By packing the cervix and lower uterine segment	1
Fetal mortality	3
Fetal mortality after seventh month of pregnancy	0
Maternal mortality	0

No.	Hospital No.	Age	Previous Pregnancy	Duration of Pregnancy when Symptoms Appeared	Pre-Eclamptic Symptoms or Signs	Gradual Rise in B. P.	No. Showing Albumin and Casts	Edema	Convulsions	Rest in Bed No. Days	Milk Diet	Relief Temporary	Relief Permanent	Induction of Labor	Fetal Mortality	Maternal Mortality	Examination Six Months After Delivery
1	2022	32	0	6½ Mos.	1	0	1	0	0	15	1	1	0	Spontaneous	0	0	Urine Neg. B. P.-135/70
2	2834	28	1	6½ Mos.	1	1	0	0	0	30	1	1	0	Bag	1	0	Urine Neg. B. P.-135/70
3	1632	39	0	7 Mos.	1	0	1	1	0	10	1	1	0	Cervical Pack	0	0	
4	1830	24	0	8 Mos.	1	1	0	0	0	7	1	0	0	C. Oil & Quinin	0	0	Urine Neg. B. P.-130/85
5	2667	32	0	6½ Mos.	1	0	1	1	0	30	1	0	0	Bag	1	0	Albumin plus 1. B. P.-130/70
6	2645	26	1	8½ Mos.	1	0	1	0	0	10	1	0	1	0	0	0	
7	2577	36	5	8 1/3 Mos.	1	1	0	1	0	14	1	1	0	C. Oil Q. Bag	0	0	Urine Neg. B. P.-148/95
8	974	26	0	7½ Mos.	1	0	1	1	1	0	0	0	0	Bag	1	0	Ur. Neg.N.P.N.-17.5. B. P. 135/70
9	2388	34	0	8 Mos.	1	1	0	0	0	10	1	0	1	0	0	0	Urine Neg. B. P.-110/80
10	784	29	2	8½ Mos.	1	0	1	0	0	0	0	—	—	C. Oil & Quinin	0	0	
11	679	28	0	7¾ Mos.	1	0	0	1	0	10	1	0	1	0	0	0	
12	872	25	5	8½ Mos.	1	1	0	1	0	7	1	1	0	C. Oil & Quinin	0	0	Urine Neg. B. P.-165/100
13	2002	31	2	6 Mos.	1	1	1	0	0	7	1	0	1	0	0	0	
14	1129	23	1	8½ Mos.	1	0	0	0	0	7	1	0	0	C. Oil & Quinin	0	0	
15	2555	25	0	7¾ Mos.	1	1	0	1	0	10	1	0	0	0	0	0	Urine Neg. B.-P.-125/70
16	2530	27	0	9 Mos.	1	1	0	1	0	7	1	0	0	Bag	0	0	
17	2238	23	0	9 Mos.	1	1	1	1	0	0	0	—	0	C. Oil & Quinin	0	0	
18	1478	26	8	9 Mos.	1	0	0	1	0	0	0	—	—	—	0	0	
19	1731	28	4	8½ Mos.	1	1	0	1	0	0	0	—	—	Bag	0	0	
20	1865	39	9	8¼ Mos.	1	1	0	1	0	10	1	—	—	Bag	0	0	Alb. plus 1. Edema. B.P.-230/110
21	1098	38	8	8 Mos.	1	1	0	1	0	7	1	—	1	Bag	0	0	Alb. plus 1. Edema. B.P.-230/110
22	1799	25	0	8½ Mos.	1	1	0	1	0	10	1	—	—	—	0	0	
23	1661	37	0	8½ Mos.	1	1	0	0	0	4	1	1	—	—	0	0	
24	1187	33	2	8¼ Mos.	1	1	0	1	0	7	1	1	0	—	0	0	Urine Neg. B. P.-125/65
25	1661	37	0	8 Mos.	1	1	0	0	0	3	1	0	1	0	0	0	

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DISCUSSION

Dr. W. P. Knight, Greensboro: I wish to speak one word, as has been suggested by the paper, on the importance of notifying the physician early in the pregnancy. In the last four years I have been delivering from 200 to 230 babies a year, and I haven't had a case of eclampsia. In my early days we frequently had it. We all know that there has not been so much in recent years, because people are becoming educated to the importance of consulting the physician early. My observation has been that if you can see the patient early and inform her as to the proper mode of living during the entire period of pregnancy, you are not going to have any need of so much treatment afterwards. If you emphasize the importance of proper diet from the beginning—not wait until her urine shows albumin, the feet and legs begin to swell, and she is having headache—not to eat much meat, to eat largely of vegetables, to take plenty of exercise from the beginning, to drink large quantities of water—you will not have much trouble afterwards. But if you wait until the seventh month of pregnancy and the patient's urine has albumin and the patient has headaches, you are already in it. If you can educate the public to consult the physician as soon as pregnancy is made known and let him give the instructions right at the start, then there will be little danger of eclampsia.

Dr. E. A. Livingston, Gibson: When a patient starts pregnancy with a blood pressure above 150, do you try to carry her along or produce an abortion?

Dr. Proctor, closing the discussion: I think I have most of my cases reporting during the second month of pregnancy. I am very particular to instruct them as to diet, keeping their weight down, keeping the bowels open, breathing fresh air, and drinking plenty of water.

I haven't been as lucky as Dr. Knight has probably been in preventing eclampsia. We had twenty-five pre-eclamptics out of 319 cases. If you will investigate, I don't believe you will find that all have been able to get rid of pre-eclampsia. We take all the precautions, but when we have pre-eclampsia we recognize it immediately and give treatment sufficient to prevent convulsions.

The doctor referred to a patient's starting out with a blood pressure of 150. Those are hard cases; I hate to get them. What I try to do is observe the patient frequently, watch her, and make every test I possibly can to tell exactly what her condition is. Some have higher blood pressures than others, although we recognize from 120 to 130 to be normal through pregnancy. The point I want to establish is, What is the normal blood pressure? Get the patient early and take the blood pressure so

you can establish the normal for that particular person. One may have a pressure of 190 for five years prior to pregnancy. If the beginning blood pressure of 150 shows a gradual rise, my tendency would be to induce labor.

INDICATIONS FOR SURGICAL DELIVERIES AT OR NEAR FULL TERM PREGNANCY

R. B. Davis, M.D., Greensboro

Definition. In this paper I shall not attempt to discuss the indications for forceps delivery, nor the correction of abnormal presentations of the child, because they occupy a field of their own and also because I believe that these subjects are well mastered by the profession at large. Some of the cleverest operations that I have seen have been forceps deliveries by a general practitioner.

History. The association of surgery with obstetrics has been in vogue for a long time. We are all familiar with the classical operation known as the cesarean section, which was so named because Caesar was supposed to have been delivered by that method. This operation must have been used with some success before his time or it would not have been employed as an experiment in a family so prominent as Caesar's. As far as medical history goes back, we are told that water-headed babies have been seen. In the surgical kit of our honored forefathers we have often found the instrument known as a trepan for the purpose of puncturing the head in order to allow the escape of the fluid before the baby could be delivered. We see, therefore, that there were definite indications for surgical deliveries long before aseptic surgery had its birth.

Classifications. For the purpose of study I desire to present the subject under two main classifications: (1) Indications for surgical deliveries brought about by abnormalities of products of conception. Under this heading we will consider: placenta previa, hydrocephalus, congenital cystic kidneys and the rarer forms of abnormalities and monstrosities. (2) Indications for surgical deliveries brought about by abnormalities of the mother. Under this heading we will consider contracted pelves, tumors, eclampsia, tuberculosis, and myocarditis.

Placenta Previa. This type of indication is by no means a rare one. The differential diagnosis between the marginal and the central type is very important, in regard to the treatment, because the one will deliver spontaneously practically always while the other will almost invariably give both a fetal and a maternal mortality, if allowed to go on without surgical intervention. The diagnosis is easily made by an examination. The examining fingers will come in contact with a soft, boggy mass around the internal os. This mass will be attached either completely or partially around the os according as to whether it is a marginal or central placenta previa. The history of the case will be that the patient has had more or less frequent spells of flowing during the last half of her pregnancy, and if labor has progressed far enough for the cervix to dilate you will notice that the flow of bright red blood is more than you would expect from the amount of dilatation present. In the central type of placenta previa surgical intervention should not be delayed at any cost.

There is no excuse for procrastination. The woman's life now is in your hands and you must see her through. The choice of the operation should, of course, be left to the operator. If the cervix is dilated or easily dilatable he would do a podalic version and ply the cervix with a thigh of the child to prevent hemorrhage. If the cervix is not readily dilatable he will in all probability prefer doing a low cesarean section.

Hydrocephalus. This type of indication, while not nearly as common as placenta previa, yet is seen often enough for nearly every busy practitioner to come in contact with it. This is the most common form of deformity of the child necessitating a surgical delivery. As the name implies, our problem here is a water-head baby. The general rule is that the head reaches such a size as to make it impossible for the head to be delivered, until, of course, the water has been let out. If the head is presenting then the lower abdomen is very large and out of proportion to the rest of the abdominal enlargement. Upon bimanual examination you are able to obtain a fluctuating wave. The fontanels are much wider than normal and the head is softer. Labor will come on as in the normal case but the hard pains will not seem to engage the head. The cervix will dilate and the membranes will rupture and still no progress is made in the case. You will note a fullness just above the pubic bones in the middle line, and think that you are dealing with a bladder full of urine. But when you catheterize you will get practically no urine and the mass will remain. If the buttock is presenting, and this is frequently the case in hydrocephalus, then the upper abdomen is larger and out of proportion with the rest. This enlargement, however, is often not noticed until the membranes rupture. One will think that some of the waters must be dammed back in the upper abdomen, as sometimes happens. One will also get a peculiar crackling sound upon deep palpation which is almost diagnostic. This sound can be likened to the sound made by rumpling a piece of thick paper under a rubber sheet. Labor will progress in the normal manner until the body and arms of the child are delivered and then the trouble begins. Most of us are apt to get impatient at this stage and pull upon the child with terrific force. When the finger is put into the mouth and the baby's body rotated upward toward the woman's abdomen with traction there should in the normal case be a delivery of the head. If there is no sign of the head coming down, upon a moderate amount of traction, one should not pull with all his might thinking he can deliver the baby whether or not. He will do an infinite amount of harm to the soft parts of the birth canal. He should at once, if he has not already done so and made the diagnosis, begin to think about hydrocephalus. If the lower abdomen be now examined one will notice a mass corresponding to the position of the bladder and which was not there before the baby's body was delivered. This is harder than a distended bladder would be. Of course, wherever you suspect a case of hydrocephalus the patient should be removed immediately to a hospital. But since often the diagnosis is not made until labor has begun the x-ray is not available, therefore, we cannot get any help from it. In a case of hydrocephalus the baby should not be given consideration because in the majority of cases it will not live anyway and if it does will in all probability be an imbecile or an idiot. Therefore, we have a clear-cut indication for a craniotomy in a case of hydrocephalus.

Congenital Cystic Kidney. While this malady is rare there have been reported some fifty or one hundred cases. In the case of a congenital cystic kidney the abdomen of the mother is extremely large. She presents rather the picture of an enormously distended ovarian cyst than the picture of pregnancy. The outline of the child is extremely difficult to make out; in fact, often cannot be made out at all. The impulse from the kick of the child's limbs, however, is very distinctly felt. The heart sounds are very distant if heard at all. There can be felt a fluctuating wave in many cases. However, these signs do not warrant a surgical delivery until the case has had the labor test, because one will find it a very difficult thing to make a diagnosis between this condition and hydramnios. But, if he will allow labor to set in, the cervix dilate and the membranes rupture then the case of hydramnios will, of course, be perfectly evident if this undue enlargement disappears. Still, gentlemen, we should give nature a fair chance to deliver the child. What will usually happen in the case of the cystic kidney will be that whatever part is presenting will deliver up to the abdomen of the child and there hang up for good. Now, we have an indication for a surgical delivery. A puncture of the cyst will usually be all that is necessary. These children are almost always very poorly developed and undernourished and, therefore, we are not concerned so much about the child.

Monstrosities and Abnormalities. Under the last grouping of abnormalities of the products of conception, the most common of these is an extra uterine pregnancy, but this seldom goes to term. We also have the various monstrosities and abnormalities that are seen in the pathological museums of the country. They are seldom if ever diagnosed before the delivery. If the baby cannot be delivered spontaneously then it must be delivered surgically, and this is about all the diagnosis that is necessary in these cases.

Under the abnormalities of the mother I wish to present two subgroups. (1) The abnormalities of the pelvis and the pelvic organs, and (2) the abnormalities of the other systems of the body.

Contracted Pelves. A contracted pelvis *per se* means very little to the surgeon. But the degree of the contraction—the size of the child—the general condition of the woman, whether a multipara or primipara, and whether she is a negro or a white woman, does mean a great deal to him in making the decision as to whether a surgical delivery is going to be necessary in any given case. I know of nothing in all the scope of medicine and surgery that requires a more careful survey of every factor connected with the case, than does the management of a primipara with a contracted pelvis of the border line type. Many cases which seem to fulfill every indication in the text books for a surgical delivery will in reality deliver themselves spontaneously with a perfectly normal baby. To look for a rule to act by seems to be the easiest way to get into trouble. The late Dr. Ernest LaPlace, of Philadelphia, often told his students not to look for too many hard and fast rules but to "fulfill the indications." This advice was never more applicable than it is here. The old adage that every case is a law unto itself is also very applicable here. No real surgeon will allow himself to be bound too literally to rules. Rules to think by are all right and proper, but rules to act by are danger-

ous things. Given a contracted pelvis with an oblique conjugate of seven cm. or less, a normal size baby and the woman a primipara, a surgical delivery will in all probability be necessary. Where the oblique conjugate is larger than seven or eight cm., but not more than ten or eleven cm., we can consider it a border line case provided every thing else is in favor of a spontaneous delivery. The oblique conjugate is the most practical measurement of the pelvis, in the judgment of the writer. We all who are in active work have fingers, and this measurement can be made with nothing but the fingers. The oblique conjugate, as you know, is nothing but the measurement from the under surface of the symphysis to the promontory of the sacrum. If absolutely necessary, it could be made even by a rectal examination. In the border-line cases, where the woman has had previous spontaneous deliveries, the child does not seem to be unduly large and the condition of the mother is good, she should be allowed to have the labor test before a surgical delivery is undertaken. If she has not suffered from spondylolisthesis or had an accident of some kind which has deformed her pelvis the chances are that she will deliver herself again. All contracted pelves should be taken to the hospital but all do not require a surgical delivery. I recall several cases of contracted pelvis in which prominent obstetricians were called into consultation. They made a diagnosis of contracted pelvis of such a degree that a baby could not be delivered and therefore recommended a cesarean section as soon as labor had set in. One of these cases delivered herself in the ambulance on the way to the hospital, and by the way, she was a negro woman. The other case was delivered by the intern at the hospital before the obstetrician had time to get there. These cases, gentlemen, are not out of the ordinary. Eminent authorities, including Williams and Schultz, claim that seventy-five or eighty per cent of all contracted pelves will deliver themselves.

Fibroid. Next to the contracted pelvis requiring a surgical delivery is a fibroid tumor of the lower uterine segment or an ovarian cyst of a large size. A pregnancy associated with tumors large enough to prevent a normal delivery is rather rare. When it does occur the history of the case is very valuable in making a diagnosis. If there is a fibroid, and it is of the submucous type, the patient will give the history of bleeding at infrequent intervals even before conception took place. In some cases she has noticed herself that there was a large, smooth, freely movable mass in the lower abdomen. The menstruations, as she thought, did not stop as they should if she were pregnant. For that reason she thought for several months that she was not pregnant. Palpation of the abdomen will make us think that we have a twin pregnancy. But only one heart sound can be heard and the upper abdomen will look more or less normal for a single pregnancy.

Ovarian Cyst. In the case of the ovarian cyst the symptoms are practically the same as in fibroid except the history will say that the patient has been subject to sharp shooting pains in the lower abdomen which come on very quickly and leave very quickly but leave the abdomen very sore. Upon palpation you will find that the extra mass in the abdomen is not as hard as in the case of the fibroid. You may even get a fluctuating wave but this is unusual unless the cyst is very large in preg-

nancy. All tumors of the pelvis are more readily detected when the buttock is presenting. The heart sounds are not in the proper place if one determines the tumor as the head of the baby. In many cases of tumors we shall not be able to make a diagnosis, but if we are on the lookout for these symptoms we shall diagnose many of them and in those that we do not diagnose we shall know that there is something radically wrong and after the labor test has been given a trial, and failed, a surgical delivery will be recommended. This will, of course, clear up the diagnosis.

Systemic Conditions of Mother. Under the heading of systemic conditions of the mother we will first discuss *eclampsia,* which is by far the most frequent indication for a surgical delivery. There has been a great tendency on the part of the profession in very recent years to be more and more conservative in the treatment of eclampsia. There was a time, of course, when the treatment was too radical and this was unfortunate. However, as you well know there is a danger now that the pendulum will swing too far in the other direction and this too will be unfortunate. Infection following the surgical delivery has been the "bugbear" responsible for this, I am sure. The writer personally cannot see why the conservative treatment cannot in many cases be used in conjunction with the surgical delivery and better results obtained. If a patient has a systolic B. P. of two hundred or over, albumin and casts in the urine, rapid pulse, edema and an albuminuria retinitis, she should be immediately put on the conservative treatment. But if she shows no signs of clearing up in twelve hours, and especially if she is a primipara, or a multipara with a history of long and difficult labors, or if she develops convulsions in rapid succession, she should have a surgical delivery.

Rules. Speaking about rules to go by, I remember very distinctly an incident that happened to me in general practice several years ago. An elderly physician friend of mine and one in whom I had the utmost confidence, and still have for that matter, told me this. He said, "Davis, if you have an eclamptic woman with convulsions who does not regain consciousness between the convulsions, even after you deliver the child, you can just put it down that she is going to die." A few days after this, I had a call to a colored woman who was having fits to beat the band. She was having one every fifteen minutes to a half hour. I loaded her with morphin, ruptured the membranes, inserted a catheter to bring on labor pains and gave her a wet hot pack. In four or five hours labor pains started and inside of two more hours the baby was here. But still convulsions came fast and hard and the woman did not regain consciousness. Acting upon the good advice of my friend, I told the family that she was going to die and that if they wanted another doctor it was all right with me. They thanked me for being so frank and said they would let me know in a few hours. That afternoon I had heard nothing so I went back to see her. They met me at the gate and told me that they had called in the colored doctor and that he was going to treat the case. That was eight years ago and the woman is still living and having babies. So my rule since then is never to say a woman is going to die until she is dead and then I know that I am right.

Tuberculosis. In the case of an active tuberculosis of the lungs where the patient is running a fever of over a hundred and is emaciated, one

should consider very carefully the situation before she is allowed to go through the stress of a spontaneous delivery. Of course, if the woman is a multipara with the history of delivering herself in a very few minutes, one would hesitate to interfere. But the average case will do better if some surgical procedure is used to help relieve the mother of the stress and strain of a labor. Arrested cases of tuberculosis of the lungs or elsewhere do not call for a surgical delivery.

Myocarditis. In the cases of myocarditis as in the cases of contracted pelvis the degree or stage of the malady has all to do with our making a decision for or against a surgical delivery. The far advanced cases of myocarditis with fatigue and exhaustion upon moderate exertion, cyanosis and venous distention, congestion of the lungs and kidneys, and an irregular pulse should under no consideration be allowed to go through a labor without help of some kind. Wagner calls attention to the cases of myocarditis associated with mitrol stenosis giving a high mortality rate.

Summary. This paper was not written with the idea of bringing out anything new, but simply for a review to freshen our minds and if possible make our way a little easier when we are confronted with cases that seemingly require a surgical delivery. I cannot refrain here from mentioning infection. As stated above in this paper the great "bug-bear" to the surgeon in the cases of surgical delivery is the infection that follows. In many cases the infection can be traced back to too many vaginal examinations, or too little respect for asepsis. If the maternal mortality from surgical deliveries is to be decreased it must be through the efforts of the attending doctor to reduce the number of vaginal examinations to the minimum and, where it is necessary, to use every care and observe every rule of asepsis.

Conclusions. In conclusion let us review for a moment. (1) All cases where there is a suspicion that a surgical delivery is going to be necessary should be removed to the hospital as soon as labor has started or before it does start. (2) All cases where the indication is not clear-cut should have the privilege of the labor test. (3) All cases of placenta previa (central) should be delivered as soon as the diagnosis is made, whether labor has started or not.

DISCUSSION

Dr. Oren Moore, Charlotte: The old Braxton-Hicks method to stop bleeding so regularly ends in the death of the baby. Potter's method fulfills the indication if you are going to do version or rapid delivery. If, on the other hand, you are a better surgeon than obstetrician, you ought to do a cesarean, as well as when other conditions demand immediate rapid delivery. I think that question will never be definitely settled. Whenever you find a group of men who are doing referred work, which includes obstetrics, you are going to find that they will do the thing which they can do best. If you are a better surgeon, you should do a cesarean; if you are a better obstetrician, you should use some method of natural delivery.

As to the time for doing these deliveries, I know nothing better than to quote De Lee. He states whatever the month is, when the previa is discovered, then is the time to do delivery. If the family refuses to allow

you, resign and leave the case in the hands of some man who is a greater gambler than you are. I think that is entirely good advice and should be acted upon. When the crisis of previa comes, if you deliver early you have complete control of the case.

"Cystic kidneys," he remarks, "should be punctured if they are diagnosed." If they are not diagnosed, puncture at time of delivery if you can reach them; but there is quite a lot of difficulty in reaching them.

You can not set down any rule on monstrosities.

Hydrocephalus has been accompanied by other deformities, very frequently by clubbed feet and spina bifida. Sometimes an examination of the clubbed feet will complete the diagnosis of suspected hydrocephalus and allow you to make your plans either for operating, delivery, or waiting for the patient to deliver.

Dr. Davis' observation on contraction of the pelvis is entirely normal, and I want to make a confession of my own feelings with regard to pelvic measurement in disproportion. I have for a long time found I couldn't understand the exact mechanical means by which you can determine that a given woman will deliver a given size baby. But I have a feeling that through many years of investigating these pelves with my hand in anywhere near the borderline case I will get the assurance that the baby can come through by the way the pelvis feels in regard to the size of the head and not by actual measurements as they are written down coldly on the record. When you deal with pelves year in and year out, you can feel when a case can come through by the old sense of touch and not by what it measures. That is my reaction.

Aside from the danger of interfering with labor, there is the danger of rupture of the fibroid wall, with the consequent hemorrhage and danger to life of mother and to the baby. I have seen cases in which the first pains exerted so much pressure on the fibroid in the walls that they gave serious hemorrhages.

As for ovarian cyst, the danger aside from rupture at the time of labor is also twisted pedicle immediately after labor. When the abdomen goes down the cyst will go down ten or twelve days after labor.

As to the question of tuberculosis, I can do no better than to quote from C. C. Norris in Philadelphia, who examined 123 cases who were found to have tuberculosis. Seventy-three per cent. lighted up during pregnancy to an extent that endangered their lives. Consequently, a woman who has had active tuberculosis at all recently should not be allowed to proceed with pregnancy. If she does, the good effects are lost; her good metabolism is lost after delivery.

Dr. Davis (closing the discussion): There is one part I skipped over purposely, due to lack of time, and which I cannot now refrain from calling attention to. That is the fact that if we are to do anything in a surgical way to help the obstetrician and the general practioner, it is going to be with his coöperation in treating the case aseptically and making the examinations as few as possible and as far between as possible; because, as mentioned in the paper, the danger of infection is very great in many of these surgical deliveries. We have cases coming in to us in which we frequently are called upon to make a decision for the general practitioner doing obstetrics as to whether a surgical delivery

is necessary. The principal thing in our minds is whether or not that case is going to become infected. So we should be particular in making examinations in all cases, but particularly cases that do not look exactly normal to us, and to use the rectum as much as possible. If you have to make an examination, which of course you do, do it aseptically.

I have purposely left out a lot of material as to why a patient should be allowed to go on. If she goes on to full term that is not the surgeon's responsibility and he must not criticize. He is to take the case at full term as brought to him in the hospital by the attending doctor.

THE POSSIBILITIES OF THE POTTER VERSION

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In this day of systematizing and budget making, even the home has not escaped organization. With birth-control literature on sale at the news-stands in our cities and contraceptive measures available to all, it is now possible to regulate the size and sequence of the family. The housewife now plans every day and is essentially a business woman. All these things affect the doctor and especially the obstetrician. When these women engage him to look after them during pregnancy and labor, they do so with the idea of his being of real service and not as an interested spectator or observer. They know full well that the woman across the street had her baby without excessive pain, or that the one down the street did not have any convulsions, et cetera. And when pain gets severe they don't see why they can't have chloroform or "the needle" or ether enema or some such relief. The sympathetic statement that "Women have been having babies in this manner ever since Eve," or "Let nature have her way" is a sorry bromide and falls on non-receptive ears during the second stage of labor.

Let us not be misunderstood on the question of pain. Any procedure ever predicated on pain-relieving alone has not become permanent. It is only when we think of maternal and infant mortality and morbidity that we arrive at the proper solution and station. We say that most women will have their babies if nothing be done, and that it is a natural process. So they will and so it is. But what other natural process, except death itself, carries a mortality of 1 in 127 in North Carolina? The same nature that starts labor pains also forms pelves, and gives doctors certain talents and means of service.

So instead of thinking only of nature's greatness, we should try and be her handmaidens—or masculine equivalents—and help smooth out the road and at least heed the danger signals.

I mentioned some figures on mortality. We all know the value and uncertainty of statistics. But when we say that 1 out of 10 newborn, and 1 out of 130 mothers dies under our care at childbirth, we are speaking a truth which all can vouch for but cannot understand. It would appear that instead of being a natural process, pregnancy is a fairly fatal disease.

We are speaking of mortality, but morbidity, poor health and prematurely old, miserable, and sphincterless women, is a more familiar tongue. It seems discouraging when we know that the general ma-

ternity mortality rate has not been decreased in the past 20 years, and the only improvement in the rate has been among the midwives. Yet we feel hopeful when DeLee reports 40,000 women delivered in Chicago Lying-in-Charity without a death from eclampsia, and that Potter, in Buffalo in 1921, delivered 1113 women without a maternal death.

About 1920 Longaker, at the Kensington Hospital for Women in Philadelphia, began doing routine podalic versions. During the organization of the clinic and while the technic was being perfected, he had a higher infant mortality, but Brewer's recent analysis of 4,000 cases shows the odds, both for mother and baby, in favor of version.

It is interesting to go into the inception of version as practiced by Potter. The city of Buffalo has a large foreign population, consequently many women are delivered by midwives. This group called on Potter in time of trouble. He had to work out some satisfactory method of relieving these mismanaged and badly abused cases. He noticed that the patients who had fewer puerperal complications and did best were those on whom version had been performed. On sound reasoning he carried these observations further, and evolved the idea and technic of routine delivery by this method when possible.

The technic which we followed at the Kensington Hospital was based on Potter's teaching and could be adopted in any clinic. The patient is first adjudged suitable for version. The preparation on admission followed orthodox methods. If labor is slow, and the cervix is hard and slow in dilating, morphin and scopolamin is used. Occasionally sacral anesthesia or Gwathmey rectal anesthesia are employed. When the os is dilated or dilatable, the operation is started. The patient is anesthetized before scrubbing begins. The choice of anesthetic is a personal matter. We used chloroform with good results. Proper cleansing cannot be satisfactorily done without narcosis. The vulva and adjoining region are thoroughly and conscientiously washed with liquid soap and warm water, after which the vagina is invaded and just as conscientiously cleansed. The vaginal glands, Skene's glands, and folds of mucous membrane are emptied by the scrubbing, and questionable tenants flushed out. The hand, with plenty of soap, is carried from the tip of the sacrum to the posterior vaginal orifice with repeated forceful movements, thus ironing out the perineum. When this process is completed the vagina should easily admit the closed fist. At this juncture the bladder is catheterized, the patient draped with sterile goods, and the long gloves put on. Two nurses should hold the patient's legs, so as to aid the operator, and put the patient in the modified Walcher position during extraction. With the fingers of the left hand the cervix is sought. If dilatation is not complete, it is completed. The head is pushed well up out of the pelvis and held up by the right hand on the abdomen. This is very important and greatly facilitates matters. By doing this the lower extremities are brought down and the operator's arm is not cramped. Carrying the left hand up along the uterine wall, the feet are encountered, the membrane ruptured, and both feet grasped between the index and middle fingers, using the thumb to brace the index finger. By pulling on the feet with the left hand, and manipulating the body with the right, the child is further turned and the feet are brought down to the

vulva. Hold on to them until the knees appear. Now search quickly for the cord. If the child is astride it, it should be freed. The feet are brought down with the toes pointing upward, until the child actually sits on the mother's perineum. Unless some contingency is present there is no need for haste. Anesthesia is suspended and the mother allowed to come to and have a few pains. Now grasp the legs separately and make traction downward. Pressure from above at this time is very dangerous, as it is likely to cause the arms to go over the head. It is now important to watch closely to ascertain the direction in which the child's body will rotate, and assist it slightly in the rotation. You learn to tell which shoulder will deliver the easiest and should favor this shoulder in anterior rotation. Soon the scapula appears. Often by simply carrying the angle of the scapula towards the spinal column the arm will flip out. The other arm can be delivered posteriorly or carried anteriorly. The head must next be delivered. Here you had best make haste slowly. With the left index finger in the child's mouth and the child astride the arm, pressure is made suprapubically (Wiegand method). If this does not suffice, the right hand is quickly slipped down on the child's shoulders and pressure made there, at the same time an assistant pushes from above. Often by simply turning the child's head from the anteroposterior to the oblique diameter, the delivery will be much easier. As soon as the child's mouth appears at the vulva the danger of asphyxia is over. The feet are held up and mucus is expressed from the trachea by pressure along the neck and by suction. In urgent cases we found Alphalobelin most helpful at this stage. You can slowly deliver the head, supporting the perineum and preventing laceration in a greater number of cases. The third stage is carried out as usual.

The only noteworthy matters during labor and puerperium that have not been mentioned are that we followed the Rotunda idea and made all examinations by the rectum. This gives all the necessary information. Two days after delivery the patient is made to lie on her abdomen twenty minutes every four hours, and taught the knee-chest posture before she goes home. These measures definitely lessen puerperal retroversions, as found in the follow-up clinic.

Some say that version is too dangerous, and that risk to mother and child is too great. I saw all the failures which occurred in a clinic during a period of time in which well over a thousand such deliveries were done. Three cases of placenta previa were lost. Two of the mothers were bled white, and in all three there had been repeated vaginal examinations and manipulations with no regard for sterility. In one woman a foot had been brought down. In all these cases cesarean section was prohibited. In one woman the cervix was torn up past the internal os, and the woman died from hemorrhage into the peritoneal cavity from the cervical artery while an effort was being made to stop the bleeding from above. No death resulted from septicemia. In the beginning there was an increase in the number of stillbirths, but the loss was compensated for during the first thousand deliveries. Realizing that this procedure was somewhat new in this generation, we assumed all responsibility for infant mortality, which stimulated us to more closely investigate the deaths. One of the first fatalities was a child that we could not get to

breathe. It showed a complete absence of the diaphragm on the left side. with the abdominal viscera crowding the small lungs into the apex of the thorax. Another showed a congenital heart lesion that would have been anybody's death. Two had subdural hemorrhage. Rucker analyzed twenty fatalities. Three had markedly enlarged thymuses, two had bronchopneumonia, one had severe endocarditis, two had subdural hemorrhage. Both of these were in very difficult deliveries. The incidence of subdural hemorrhage in these thirty-odd cases is less than in other methods of delivery. The occurrence of fractures of the extremities is really rare in well governed versions, and if the possibility is kept in mind the fracture seldom occurs.

The only constant contra-indications to version are funnel pelvis, and an inlet so constricted that it will not admit the head, and such disproportions. One learns to spot the difficult cases fairly constantly. We had difficulty with placenta previa and preferred section. Rucker has better results, which is probably explained by the fact that he induces labor on his patients sooner, using a bag and slow dilatation.

Now that the failures have been recounted, the advantages should be given their proper place.

The picture of a long-drawn-out labor is all too vivid in our minds. It is a thing we would like to run from: A primapara pacing the floor for hours, or a multipara with a posterior occiput; no appetite, and unable to eat if the desire were present, gradually getting into an undesirable frame of mind and wretched physical condition, seeking aid and relief, and deserving it. Often they seek in vain. Most of these patients can be delivered within an hour by version if the cervix is dilated or dilatable. And what a relief to patient, family, and doctor. The time element is most important. We all know that swollen, edematous, congested tissues are more prone to bruises, lacerations, and infection, and that exhausted uterine muscle is much more likely to bleed. By doing version the time of labor is undoubtedly reduced to half and the suffering to the very minimum. You do not see the shocked, pale, weak picture of utter exhaustion that so often follows long slow labors.

Rucker says, "The integrity of the birth canal is preserved in a manner that I have never been able to do until I began doing Potter version." This has also been Longaker's experience. Postpartum hemorrhage is less likely to follow a quick delivery. The uterine tone is maintained and the general bodily strength conserved, all of which works together for good. Labor may be a physiological process, but it is also a surgical procedure. Most obstetrical emergencies are surgical problems. Sir Victor Bonney says that "Labor is a surgical operation, and even though a woman performs it on herself, it should be done in conformity with surgical principles". If this be true let us take it out of the emergency operation list. Let us not classify it with strangulated hernia, intestinal obstruction, and hemorrhage, which swell our mortality rate. Let us rather deliberately schedule it with the other operations. It belongs among the chronic ailments. Longaker says "Version can be so selective and elective that perfect results—ideal from standpoint of early relief from suffering, freedom from morbidity, and lessening of birth mortality—can be almost uniformly obtained. In proof some seventy-

five cases in the hands of a dozen men under my supervision and all successfully terminated without a single bad result, and these men all hospital interns with but a limited amount of experience". Routine version and the results should be judged on its own merits. It should not be charged with the poor showing of the so-called indicated version, such as prolapsed cord or extremities or decompressing breech extractions and such. These are most unsatisfactory for any type of operation. This paper is not a plea for the Potter version to the exclusion of the other splendid methods of relief in the second stage of labor. Version is not a new method at all. It had many advocates during the eighteenth and nineteenth century on the continent and in England. The most notorious was Mr. Figg, who gave versions a great ride. Sepsis helped to unhorse him. The many types of new forceps, the new antiseptics, the new anesthetics, the prophylactic forceps application as advocated by DeLee, and the many little tricks of helping out, all point to the fact that greater and more exacting demands are being made on the obstetrician. The ideal obstetrician has been described as a man who embraces the composite of "a skilled diagnostician, a sensible therapeutist, an endocrinologist, an experienced hygienist, and a clean surgeon."

If version has sufficient virtue, it will survive. A method or an idea is not wrong simply because it is new and untried. It should be carried into the delivery room and allowed to go on to that much fought over battleground—the impartial proving ground of the second stage of labor and the equally impartial post-natal clinic. A very comprehensive and worthwhile decision can then be rendered.

DISCUSSION

Dr. C. D. Cater, Greensboro: I am sure we all know of Dr. Potter and his successful deliveries with his method. It was an eye-opener to me that out of 75 cases of version delivery supervised by DeRose he did not have a single fatality, because before his paper was read I had always dreaded—and had a right to dread—a breech delivery or vertex that had to be converted into a breech for any reason. I have seen and heard the neck crack, and it is a feeling you will never get over. But with the technic of Potter it seems the version has virtue and is a thing that does relieve pain. I can't help but say, "Let us aid Nature; let us help to relieve pain, and let us do versions when they are indicated." That is when we can conserve the mother and the child to our best ability medically and not seek to gain a reputation of painless childbirth. Don't let us establish any set, pedantic rule in the home. Of course, if we come from the clinics and have clinical aid and the hospital, we can do these things. That is the reason Jackson is doing bronchoscopy so well. He does it every day or so. But if we don't have versions and can't keep in constant work with it, I believe we will get into trouble.

As to the interests of the child: I can't help but feel that there is a big possibility for more vertebral injuries in a vertex that has been changed into a breech with an extraction. In breech labors you are apt to get paralysis of your lower extremities from some vertebral injury or injury in the spinal cord. There is quite often after a version paralysis and hardly ever, if ever, after a spontaneous delivery. In the average man a version offers more opportunity for fractured femur. In twin

delivery, if the first child comes as a vertex and the second one has to be taken, I have never seen the fracture of a femur in the first child but I have seen it in the second child that was delivered by breech or had to be done by version.

Dr. Ross (closing the discussion): When the child is sitting on the mother's perineum it is better to make haste slowly and let the mother in a way expel the baby. I meant to convey the same idea that Dr. Spicer did—that the child comes out in the same direction.

As to the question of forceps, that is something about which you can not be dogmatic. Potter does 10 per cent cesarean sections. He has some inherent gift of prophecy that nobody else seems to have in selecting his cases. I am inclined to agree that all there is to do is to dilate. The last child I lost I attempted to use the forceps and the child's neck was broken from hyperextension of the neck. It did not tear the cervix. That is one reason I don't like the forceps.

This is not a plea for version, but if a man gets good results it is bound to have some virtue. The thing is to find out how often it should be used.

UTERINE HEMORRHAGE

R. D. McMillan, M.D., Red Springs

Unusual bleeding from the uterus at or between menstrual periods occasions alarm in the mind of the patient or the members of the immediately family and is one of the common serious symptoms for which the gynecologist is consulted.

The various conditions causing uterine hemorrhage fall into two main groups: (1) Those dependent on recent pregnancy, and (2) those not dependent on recent pregnancy. If we bear in mind these two main groups a study of uterine hemorrhage becomes much easier.

Bleeding during pregnancy is always preceded by a varying period of amenorrhea. In the early months the most usual bleeding occurs in threatened abortion, inevitable abortion, and a large class of incomplete abortions where either spontaneous or induced miscarriage has taken place and the contents of the uterus have been incompletely evacuated. In these cases the hemorrhage is always irregular and persistent, and at times copious. Often the patient has no positive knowledge that any portion of the contents has been passed. Clinically the uterus is large and tender, cervix partially open, and on bimanual examinations expels some detritus. Usually there is some elevation of temperature and slight leukocytosis.

Ectopic pregnancy makes up the next largest class of irregular bleeding due to the pregnant state. Twenty-five years ago few physicians knew anything at all about ectopic pregnancy. Today nearly all cases can be recognized when rupture occurs, and many of them are diagnosed before rupture takes place, when operation can be performed with relative ease and little danger to patient. The cardinal symptoms of ectopic pregnancy are delayed, skipped, or anomalous menstruation followed by coliky pains referred to lower abdomen, usually to one side, often mistaken for gas colic or indigestion. On pelvic examination the cervix is soft and is always sensitive to motion. The uterus may be dis-

placed to one side or forward by a sensitive mass in one or the other fornix; the temperature as a rule little above normal; moderate leukocytosis; red cells and hemoglobin may be slightly or markedly reduced. Remember the history, characteristic bloody discharge and sensitive cervix are most constant suggestive signs.

Hydatidiform mole or cystic degeneration of chorionic villi: Occasionally a pregnancy will apparently proceed normally for two or three months, then there will appear a little brownish discharge, or patient may not feel particularly well. The case is watched for a few weeks, when it is realized that something is radically wrong. The physician does not want to interfere or terminate a normal pregnancy, neither does he want to neglect his patient. Finally, it is apparent on account of continual bleeding that the uterus must be emptied. Upon dilating the cervix you at once encounter quantities of small cysts that vary considerably in size from that of a millet seed to that of a grape and always have the appearance of springing from one another. Cullen says they remind him of variation in size of the individual grapes seen when a grape vine has worn out or gone to seed.

Sometimes after a hydatid mole has been removed or expelled the patient continues to bleed. Upon examination the uterus is enlarged; and now and then a metastasis may be noted in the vagina or elsewhere. When the process is advanced, hemoptysis may be noted due to metastasis in the lungs. After a hydatid mole has been removed one is always suspicious that a chorio-epithelioma may develop or may have existed prior to removal of the mole. The histologic pictures of hydatid mole and chorio-epithelioma are very much alike, so much alike that a diagnosis from scrapings must not be relief upon; only a section from the wall of the uterus, which of course is possible only after removal of the uterus. In suspicious cases do not wait for developments and let metastasis occur. I urge immediate operation for removal of uterus.

Pregnancy in one horn of a bicornate uterus is really extra-uterine when considered from the standpoint of the non-pregnant horn. If uterine bleeding exists when there is tubal pregnancy we can suspect, in some cases at least, bleeding from the non-pregnant horn of a bicornate uterus when pregnancy exists in the other horn.

In the latter months of pregnancy, placenta previa and premature separation of a normally implanted placenta are the chief causes of uterine hemorrhage.

Uterine hemorrhages not due to recent pregnancy. First, we must remember that some constitutional conditions increase pelvic congestion and predispose to uterine hemorrhage. For instance, purpura, cardiac insufficiency, cirrhosis of liver, chronic nephritis, also some acute infectious diseases, including influenza and the exanthemata. These hemorrhages are of course incident to the medical condition with which they are associated. The cause of the hemorrhage is evident and as a rule the constitutional condition and not the bleeding receives attention.

Though it is not thoroughly understood just what part the endocrine system and the individual sex glands play in the woman's sexual life and development of her generative organs, it is known that she is wholly dependent for her well being upon their harmonious action. In support

of this statement I only mention that when the ovaries are removed there is a cessation of menstruation notwithstanding the retention of the uterus. In hyperthyroidism because of the overactivity of thyroid amenorrhea is the rule. In cases of deficient thyroid function there is often an increase in the menstrual bleeding. In a much smaller but still not inconsiderable group of cases, however, Novak, of Baltimore, very aptly describes a condition of uterine bleeding that may be observed in the entire absence of any demonstrable gross lesions of the pelvic organs. Indeed, extremely profuse hemorrhage may be observed in children at or near the age of puberty. Far more frequently such bleeding is noted in women at or near the menopausal age, although no period of reproductive life is immune from this possibility. Cases of this type are commonly designated as "functional", "idiopathic", or "essential". The hemorrhages are occasionally mild, and may tend toward spontaneous correction; more frequently they are sufficiently severe to lead the patient to seek medical advice; and occasionally they are quite alarming, causing grave concern to both patient and physician. In those cases which occur at or near the climacteric it can at once be seen why this should be so, for free bleeding at this period brings with it the apprehension of cancer. When the bleeding is sufficient to cause alarm in young women, and even more emphatically during middle life, the importance of a diagnostic curettage cannot be too strongly urged. Especially distinctive is the finding of hyperplasia of the endometrium to the naked eye; the endometrium in some cases is so enormously overgrown that huge quantities are brought away by the curet. Microscopically, there is a general increase in both the stromal and the epithelial elements; perhaps the most distinguishing feature is the marked disparity of the glands, some being large and cystic, while others are quite small. There is thus produced a very characteristic Swiss-cheese pattern, often so marked that a glance through the microscope is sufficient to make the diagnosis.

It is in this form of endocrine imbalance that organotherapy has some place, in spite of the fact one hesitates to elaborate on this subject because the results can scarcely provoke any degree of enthusiasm. Often, however, they are distinctly gratifying.

Thyroid extract, especially, if there are other manifestations of hypothyroidism, should by all means be tried. In view of the common absence of the glands of these cases corpus luteum should be given a trial. Posterior pituitary extract often yields good results, and daily injections of 1 cc. for six days should give improvement either by its action on the muscles of the uterus or to its specific endocrine mechanism.

Repeated curettage in young women. In most cases curettage will be followed by relief from the hemorrhage. In many cases it will be permanent, but in a large proportion, certainly not less than one half, recurrence of the symptoms will be noted, perhaps almost immediately, though in other cases not until many months later. In women who have lived their reproductive lives, and in whom the matter of child-bearing need not be considered or at any rate is distinctly subordinate to that of health, the indication is clear for radiotherapy. Here, indeed, we have the almost ideal indication for radium in gynecology, for menstruation can be checked promptly and with certainty.

Benign changes in mucous membrane of cervix and body of the uterus, as polypi. Cervical polypi bleed a little. The patient complains of slight intermenstrual bleeding and in cases in which the surface of the polypi is inflamed there may be slight purulent or watery discharge. Polypi in the body of the uterus tend to produce excessive menstrual period. There may be some slight intermenstrual bleeding as well.

Uterine Tumors: Myomas, adenomyomas, and carcinomas. The uterine myomas are very common and in the beginning are interstitial; as they grow many of them become subperitoneal. A myoma may grow to be large without in any way influencing menstruation, but as soon as it encroaches on the uterine cavity the periods are prolonged. In some cases, especially of the submucous type, the tumor becomes necrotic, causing a foul and almost continuous watery discharge from the uterus. This tissue often feels soft, but on traction is found to be tough. Cancerous tissue, on the other hand, is friable.

Adenomyomas generally cause a very profuse and prolonged menstruation, but no intermenstrual bleeding. During the period there may be a grinding pain in the uterus, due undoubtedly to swelling of the many areas of uterine mucosa in the diffuse growth of the uterine wall. Curettage as a rule yields perfectly normal mucosa. When adenomyoma exists the uterus tends to become adherent to the surrounding structures.

Sarcomas: Uterine sarcomas are relatively rare. Should sarcoma develop in the endometrium it can be diagnosed from scrapings. Sarcomas are rarely diagnosed from myoma until the abdomen is opened and the tumor cut into. Grossly sarcoma can easily be broken up with the finger, whereas it makes no impression whatever on the myoma.

Diseases of Adnexa; Salpingitis. In cases of purulent salpingitis the patient has some uterine hemorrhage. Time and again the surgeon is in doubt as to whether the given case is one of tubal pregnancy or pelvic inflammation. Fortunately, in both instances it is necessary to open the abdomen and the temporary error in diagnosis does not in any way militate against the patient's welfare.

Inflammation of ovaries is always secondary to or associated with salpingitis.

Ovarian cysts and ovarian tumors occasionally cause slight hemorrhage from the uterus. The presence of the tumor independent of the uterus gives us the clue as to the hemorrhage; with removal of the ovarian growth bleeding ceases.

Malignant Conditions: As a result of the campaign of education waged by the American Society for the Control of Cancer, and by local medical societies, patients are coming to the physician earlier and earlier, so that cases are now seen in which the physician is by no means sure whether he is dealing with cancer or not.

All metrorrhagias are serious, especially after the menopause. The patients should be sent at once to hospitals to have a wedge of the suspicious area cut out and examined microscopically. For instance, the most malignant of all uterine cancer, adenocarcinoma, frequently begins up in the cervical canal. If it so happens that the cylindrical epithelium extends down beyond the external os, as it sometimes does, then the cancer can be seen on vaginal examination, otherwise not.

In making a diagnosis of uterine bleeding a detailed history is most important, for the menstrual habit of every woman is peculiar to the individual and the variations from this habit suggest the possible diagnosis. For example, the woman who bleeds from a subinvolution will present no change in her menstruation until after the birth of her child, when the menstrual period may become more profuse or intermenstrual time may be lessened. On the other hand, the woman with a myoma will show a definite increase in the amount of her menstruation which becomes progressively greater from month to month. This in turn may be compared with the case of threatened abortion, with period of amenorrhea, profuse bleeding and passing large quantities of clotted blood. All these points can be brought out by asking each patient the following questions: (1) The time at which puberty occurred. (2) The length of each period. (3) The regularity and average duration of the interval. (4) The amount of blood lost. (5) The date of last menstruation. (6) Has the menstruation always been profuse since it began? (7) Has it been increased by marriage or childbirth? (8) Does the increased flow date from a miscarriage? (9) Has the increase in blood loss been of gradual occurrence, or has it appeared suddenly? (19) Has there been an attack of pelvic inflammation, and what was its relation to the change of menstrual habit? (11) Has there been any increase in the size of the abdomen?

While a presumptive diagnosis is suggested by the history, the final diagnosis in any case of menstrual or intermenstrual bleeding must rest upon the physical findings and the character of intrauterine contents. Hence the pathological diagnosis can be made positive only by the use of the microscope. In conclusion, I am urging upon the practitioner the necessity and value of microscopic examination in every case of anomalous bleeding except those occurring in the later months of pregnancy.

NOMINATION OF CHAIRMAN

Dr. C. S. Grayson, High Point, was nominated for appointment as chairman of the section for the following year.

Association of County Medical Society Presidents

MINUTES OF SECOND ANNUAL MEETING

WRIGHTSVILLE BEACH

JUNE 15, 1926.

The meeting was called to order by Dr. J. R. Hester, President, and the minutes were read by Dr. W. J. Meadows, Secretary.

Dr. J. W. Long recommended that Dr. J. M. Parrott be not asked to give the address scheduled on the program, on account of the condition of his health. This recommendation was followed. Dr. Cyrus Thompson then addressed the meeting on the timely subject of the relation of the general practitioner to the specialist.

The constitution and by-laws were read by the secretary and some recommendations made by the president for revision, and a committee composed of Drs. J. R. Hester, J. B. Bonner and W. W. Green was appointed to revise the by-laws.

A motion to have Dr. W. H. Cobb send to the secretary copies of the paper for each county president was carried.

The following officers were elected:

President—DR. J. BUREN SIDBURY.....Wilmington
First Vice-President—DR. R. F. LEINBACH.....Charlotte
Second Vice-President—DR. J. B. BONNER.....Washington
Third Vice-President—DR. J. T. SMITH.....Westfield
Fourth Vice-President—DR. W. H. HOUSER.....Cherryville
Secretary-Treasurer—DR. W. W. GREEN.....Tarboro

After a very appropriate talk by Dr. Leinbach on some of the functions of this section of the State Society, the meeting was adjourned until 5:00 p.m.

5:30 p.m.—The Committee on Constitution and By-laws made their report, which was accepted.

Dr. J. K. Pepper made a motion that, owing to Dr. Sidbury's inability to accept the presidency of the association, all officers be moved up, dispensing with the fourth vice-president. This motion was carried, and the officers stand as follows:

President—DR. R. F. LEINBACH.....Charlotte
First Vice-President—DR. J. B. BONNER.....Washington
Second Vice-President—DR. J. T. SMITH.....Westfield
Third Vice-President—DR. W. H. HOUSER.....Cherryville
Secretary-Treasurer—DR. W. W. GREEN.....Tarboro

Dr. Meadows moved that the president be empowered to appoint an attendance committee to consist of three or five members, as the president may see fit. Motion carried.

The meeting then adjourned *sine die*.

(Signed) W. W. GREEN, *Secretary-Treasurer*.

WOMAN'S AUXILIARY

TO THE

Medical Society of the State of North Carolina

OFFICERS FOR 1927

President—Mrs. R. S. McGeachy.....Kinston
President-Elect—Mrs. Benj. J. Lawrence.....Raleigh
First Vice-President—Mrs. W. C. Mudgett.....Southern Pines
Second Vice-President—Mrs. R. E. Brooks.....Burlington
Third Vice-President—Mrs. Julian A. Moore.....Wilmington
Treasurer—Mrs. W. P. Knight.....Greensboro
Recording Secretary—Mrs. P. P. McCain.....Sanatorium
Corresponding Secretary—Mrs. W. J. Hunnicutt.....Asheville

COUNCILORS

First District—Mrs. Isaiah Fearing.....Elizabeth City
Second District—Mrs. K. P. B. Bonner.....Morehead City
Third District—Mrs. D. R. Murchison.....Wilmington
Fourth District—Mrs. B. A. Hocutt.....Clayton
Fifth District—Mrs. A. B. Holmes.....Fairmont
Sixth District—Mrs. C. N. Sisk.....Raleigh
Seventh District—Mrs. E. B. Lattimore.....Shelby
Eighth District—Mrs. J. L. Spruill.....Jamestown
Ninth District—Mrs. C. R. Sharpe.....Lexington
Tenth District—Mrs. Guy E. Dixon.....Hendersonville

MINUTES OF FOURTH ANNUAL MEETING

The Fourth Annual Meeting of the Auxiliary to the Medical Society of the State of North Carolina was held in the Concourse of the Oceanic Hotel, Wrightsville Beach, Wednesday morning, June 16, 1926, with Mrs. J. Howell Way, president, presiding. The meeting was called to order by the president, after which all stood and repeated the Lord's prayer in concert. Mrs. Julian A. Moore, of Wilmington, then welcomed the ladies to New Hanover, and Mrs. Way responded in a most charming manner. After the roll call the minutes of the preceding meeting were read and approved.

Next on the program was an interesting report by Mrs. Guy E. Dixon, Hendersonville, a delegate to the A. M. A. Auxiliary. Mrs. Seale Harris, president of the Auxiliary to the A. M. A., was to have addressed the Auxiliary, her subject being "The Doctor's Wife", but being unable to come, she sent her paper. Just here the secretary read the program of the Auxiliary to the A. M. A.

The president asked for suggestions as to what could be done to help the Auxiliary along. Mrs. J. L. Spruill asked the duties of the councilors. In answering, Mrs. Way and Mrs. R. S. McGeachy, presi-

dent-elect, gave many helpful suggestions. Mrs. McMillan asked how many districts there are. Mrs. Way replied that there are ten. Mrs. McGeachy then read the list of the councilors.

Under the heading of unfinished business, the secretary read the Constitution. Under new business, the nominating committee read its report. By suggestion of one of the members the secretary cast the vote and the officers were elected.

At this time Mrs. J. B. Cranmer, Wilmington, announced the bridge party at the Yacht Club and the party in the evening at Lumina.

Mrs. Way then introduced Mrs. Benj. J. Lawrence, Raleigh, the president-elect, who in her attractive way spoke on the work of the Auxiliary. The members rose to greet the new president, Mrs. McGeachy. Mrs. Way made a few well chosen remarks, which were enjoyed by all present.

The new members were asked to come forward and register, and both old and new members were requested to pay their annual dues of 25 cents. As there was no further business, the meeting adjourned.

(Signed) Mrs. J. R. Hester,
Secretary pro tem.

MINUTES OF EXECUTIVE COMMITTEE

The executive committee held a called meeting in Greensboro, July 15, 1926. The secretary was instructed to write the following notice to each of the officers and councilors:

"It is the duty of each Councilor to organize her district and to elect a secretary-treasurer. Each member shall pay to this secretary-treasurer $1.00 dues (according to Constitution of Auxiliary to A. M. A.), 50 cents of which shall be kept by the local treasurer and the remaining 50 cents forwarded to Mrs. W. P. Knight, Greensboro, state treasurer. (She in turn forwards half to the national treasurer and keeps half for state expenses.) Each Councilor is urged to familiarize herself with the Constitution, which will be found in Proceedings, 1923 (Transactions State Medical Society, page 466); especially with the purpose, which is to bring about between doctors' wives a spirit of fellowship and to help in every way possible to do away with any ill feeling that may be found among members of the profession.

"Each Councilor is urged to have a full meeting (she can find what counties are in her District by referring to the above named Proceedings) of her district before Christmas when at all possible. She may appoint county chairmen to help her get in touch with the ladies; she may have the meeting at the regular District Society meeting; she may have a luncheon or a meeting at a favorite resort.

"Each District should have some special work—the educating of a doctor's child, or the support of a child in a hospital, or some other work which a health officer or welfare worker may suggest.

"A list is attached of ladies in your District who have paid 25 cents on their yearly dues (this being all that was asked at the Wrightsville meeting), so that only 25 cents more need be forwarded from each of these ladies to Mrs. Knight."

PAST PRESIDENTS

1923—Mrs. P. P. McCain (organizing chairman)....Sanatorium
1924—Mrs. P. P. McCain....Sanatorium
1925—Mrs. I. W. Faison....Charlotte
1926—Mrs. J. Howell Way....Waynesville

ROSTER OF MEMBERS

Adams, Mrs. M. R.....Statesville
*Ashby, Mrs. E. C.....Mount Airy
*Ashworth, Mrs. B. L.....Marion
Ashworth, Mrs. W. C.....Greensboro
Ball, Mrs. M. W.....Newport
Bass, Mrs. H. H.....Henderson
Beam, Mrs. R. S.....Lumberton
Bittinger, Mrs. S. M.....Sanatorium
*Blair, Mrs. A. McNiel.....Southern Pines
Bonner, Mrs. K. P. B.....Morehead City
Bonner, Mrs. O. B.....High Point
Bowman, Mrs. E. L.....McDonald
Bowman, Mrs. H. E.....Aberdeen
Brockmann, Mrs. H. L.....High Point
Brooks, Mrs. R. E.....Burlington
Broughton, Mrs. N. B., Jr.....Raleigh
Brown, Mrs. J. P.....Fairmont
*Bulla, Mrs. A. C.....Raleigh
*Bullock, Mrs. Jack H.....Oxford
Campbell, Mrs. A. C.....Raleigh
*Carter, Mrs. Paul C.....Weldon
Cheek, Mrs. C. E.....Fuquay Springs
*Choate, Mrs. B. O.....Sparta
*Choate, Mrs. G. W.....Salisbury
*Compton, Mrs. B. S.....Oteen
Cook, Mrs. H. L.....Fayetteville
Cozart, Mrs. W. S.....Fuquay Springs
*Craven, Mrs. T. C.....Ramseur
Dickie, Mrs. J. W.....Southern Pines
Dixon, Mrs. Guy E.....Hendersonville
*Dixon, Mrs. H. Carlyle.....Madison
Ellington, Mrs. A. J.....Burlington
*Faison, Mrs. I. W.....Charlotte
Fearing, Mrs. Isaiah.....Elizabeth City
Flowers, Mrs. Chas. E.....Zebulon
Gainey, Mrs. J. W.....Fayetteville
Galloway, Mrs. W. C.....Wilmington
*Gold, Mrs. Charles F.....Ellenboro
*Harden, Mrs. Graham.....Burlington
Hege, Mrs. J. Roy.....Winston-Salem
Hester, Mrs. J. R.....Knightdale
Hicks, Mrs. V. M.....Raleigh
*Hocutt, Mrs. Battle A.....Clayton
Holloway, Mrs. O. W.....Durham
Holmes, Mrs. A. B.....Fairmont
*Holt, Mrs. W. P.....Duke
Hunnicutt, Mrs. W. J.....Asheville
Hurdle, Mrs. S. W.....Winston-Salem
Irwin, Mrs. J. R.....Charlotte
*Jackson, Mrs. W. L.....High Point
*Johnson, Mrs. T. C.....Lumberton
Jones, Mrs. Beverly N.....Winston-Salem
*Keiger, Mrs. James A.....Greensboro
Keiger, Mrs. O. R.....Winston-Salem
*Kendricks, Mrs. R. C.....Elizabeth City
*Kent, Mrs. A. A.....Lenoir
Kerr, Mrs. J. E.....Winston-Salem
Kornegay, Mrs. L. W.....Rocky Mount
Knight, Mrs. W. P.....Greensboro
Lattimore, Mrs. E. B.....Shelby
Laughinghouse, Mrs. Chas. O'H., Greenville
*Lawrence, Mrs. B. J.....Raleigh
Lee, Mrs. S. M.....Sanatorium
*Linney, Mrs. R. Z.....Charlotte
*Linville, Mrs. A. Y.....Winston-Salem
*Long, Mrs. E. F.....Raleigh
*Long, Mrs. John W.....Greensboro
Lyon, Mrs. Brocton R.....Greensboro
*MacConnell, Mrs. John W.....Davidson
*McBrayer, Mrs. R.....Shelby
*McCain, Mrs. P. P.....Sanatorium
*McGeachy, Mrs. R. S.....Kinston
McGee, Mrs. J. W.....Raleigh
*McGougan, Mrs. J. V.....Fayetteville
McMillan, Mrs. E. G.....Maxton
McMillan, Mrs. R. D.....Red Springs
*McNairy, Mrs. C. Banks.....Kinston
McPherson, Mrs. C. W.....Burlington
*McPhaul, Mrs. W. A.....Charlotte
*MacRae, Mrs. John D.....Asheville
Macon, Mrs. G. H.....Warrenton

*Charter member.

Mann, Mrs. I. T. ..... High Point
Martin, Mrs. Lester P. ..... Mocksville
Miller, Mrs. J. F. ..... Marion
*Milliken, Mrs. J. S. ..... Southern Pines
Misenheimer, Mrs. C. A. ..... Charlotte
*Mitchell, Mrs. R. C. ..... Raleigh
*Moore, Mrs. Charles E. ..... Greensboro
Moore, Mrs. Julian A. ..... Wilmington
*Moore, Mrs. K. C. ..... Wilson
Moore, Mrs. Oren ..... Charlotte
Montgomery, Mrs. J. C. ..... Charlotte
Mudgett, Mrs. W. C. ..... Southern Pines
Munt, Mrs. H. F. ..... Winston-Salem
Murchison, Mrs. D. R. ..... Wilmington
*Murphy, Mrs. J. Gerald ..... Wilmington
Myers, Mrs. Alonzo ..... Charlotte
*Myers, Mrs. John Q. ..... Charlotte
*Nisbet, Mrs. D. Heath ..... Charlotte
Patterson, Mrs. J. R. ..... Kernersville
Perry, Mrs. D. R. ..... Durham
Person, Mrs. J. B. ..... Selma
Pittman, Mrs. R. L. ..... Fayetteville
Rainey, Mrs. W. T. ..... Fayetteville
Rankin, Mrs. W. S. ..... Charlotte
Ransom, Mrs. J. Lester ..... Charlotte
*Ray, Mrs. John B. ..... Leaksville
*Red, Mrs. S. C. ..... Houston, Texas
Redfern, Mrs. T. C. ..... Winston-Salem
*Redwine, Miss Edith ..... Asheville
Register, Mrs. F. M. ..... Raleigh
Rogers, Mrs. J. R. ..... Raleigh
Rozier, Mrs. R. G. ..... St. Pauls
*Russell, Mrs. Chas. R. ..... Granite Falls
Sadler, Mrs. R. C. ..... Whiteville
Scruggs, Mrs. Wm. Marvin ..... Charlotte
*Sevier, Mrs. D. E. ..... Asheville
*Sevier, Mrs. J. T. ..... Asheville
Sharpe, Mrs. C. R. ..... Lexington
Sharpe, Mrs. Frank ..... Greensboro
Shore, Mrs. C. A. ..... Raleigh
Sisk, Mrs. C. N. ..... Raleigh
Slate, Mrs. J. S. ..... Winston-Salem
*Sloan, Mrs. H. L. ..... Charlotte
Smith, Mrs. William H. ..... Goldsboro
Sossoman, Mrs. J. C. ..... Midland
Speas, Mrs. D. C. ..... Winston-Salem
Spoon, Mrs. A. O. ..... Greensboro
Spruill, Mrs. Jos. L. ..... Jamestown
Sprunt, Mrs. W. H., Jr. ..... Winston-Salem
*Starr, Mrs. H. F. ..... Greensboro
*Strong, Mrs. C. M. ..... Charlotte
Sutton, Mrs. W. G. ..... Seven Springs
Taylor, Mrs. F. R. ..... High Point
Thomas, Mrs. W. N. ..... Oxford
Townsend, Mrs. M. L. ..... Raleigh
Trivette, Mrs. W. A. ..... Hamptonville
Tuttle, Mrs. A. F. ..... Leaksville
*Watkins, Mrs. Geo. T., Jr. ..... Durham
*Way, Mrs. J. Howell ..... Waynesville
Wilkerson, Mrs. Chas. B. ..... Raleigh
Wilkerson, Mrs. T. E. ..... Raleigh
Williams, Mrs. J. H. ..... Sanatorium
*Worthington, Mrs. Frank D. ..... Charlotte

*Charter member.

THE AMERICAN COLLEGE OF PHYSICIANS

MINUTES OF THE SECOND ANNUAL MEETING OF NORTH CAROLINA FELLOWS

The North Carolina Fellows of the American College of Physicians had a dinner meeting at the Oceanic Hotel, Wrightsville Beach, Wednesday, June 15, 1926. Those present were Drs. A. McN. Blair, Wm. deB. MacNider, L. B. McBrayer, R. McBrayer, P. P. McCain, and J. Howell Way.*

The following paper was read:

THE AMERICAN COLLEGE OF PHYSICIANS: ITS PURPOSES AND ITS AIMS

J. Howell Way, M.D., F.A.C.P., Waynesville

The American College of Physicians came into existence about ten years ago in response to the demand growing out of the belief that there exists in America a place for a special organization distinctive within itself, and particularly appealing to the well rounded medical man who has not enjoyed and is not inclined to engage in either the study or exclusive practice of a specialty. It was felt that there is a field for such an organization, sponsored by men of such standing and reputation as would appeal to the profession at large on a basis of admission requirements insuring its continuance as an institution commanding respect, and whose membership would at once be accorded recognition as students of internal medicine and as physicians who are striving to secure the advancement of the science and art of medicine on lines broad enough to include the whole field of internal medicine.

The College is a corporation legally chartered under the laws of the State of Delaware and includes within its membership physicians, teachers of medicine, laboratory workers, and scientific investigators resident on the North American Continent whose field of endeavor lies outside the restricted field of surgery with its allied forms of practice and investigation. The objects of the College as set forth in its constitution are as follows: (1) To uphold and maintain high standards in medical education and practice; (2) to encourage research, especially in clinical medicine; (3) to foster measures for the prevention of disease and for improving public health; (4) to perpetuate the best traditions of medicine and to maintain high standards of medical ethics; and (5) to maintain the dignity of our profession in its relationship with patients.

The present membership of Fellows of the American College of Physicians is distributed among the various sections as follows:

*The other North Carolina Fellows are Drs. A. A. Barron, Charles L. Minor, J. P. Munroe, and W. O. Nisbet.

United States and Possessions

Alabama	4	New Mexico	1
Arizona	5	New York	168
Arkansas	7	North Carolina	10
California	61	North Dakota	0
Colorado	16	Ohio	47
Connecticut	4	Oklahoma	12
Delaware	0	Oregon	13
District of Columbia	54	Pennsylvania	100
Florida	6	Rhode Island	1
Georgia	26	South Carolina	3
Idaho	0	South Dakota	0
Illinois	67	Tennessee	16
Indiana	24	Texas	20
Iowa	11	Utah	7
Kansas	2	Vermont	2
Kentucky	13	Virginia	6
Louisiana	13	Washington	10
Maryland	25	West Virginia	20
Maine	1	Wisconsin	14
Massachusetts	14	Wyoming	0
Michigan	105	Hawaii	1
Minnesota	43	Porto Rico	2
Mississippi	6		
Missouri	45		1063
Montana	4	Other Countries	
Nebraska	24	Canada	50
Nevada	0	Mexico	1
New Hampshire	0		
New Jersey	30	Total	1114

In addition to these, there are around 650 former members of the American Congress of Internal Medicine, who, by virtue of such affiliation and by recent enactment by the College at the Detroit session (February, 1926), became Associates of the American College of Physicians, with the object of eventually attaining the rights and privileges of Fellows of the College.

The growth of the College has been steady and continuous, men from every section of America making application for membership. A fairly large number are admitted annually, notwithstanding that the admission requirements are such as to necessarily enlarge the membership from the best element of the profession while not limiting the number. Continued stress is laid from time to time upon the importance of maintaining the present high admission standards, the present president of the College, Dr. Alfred Stengel, having only recently stated in an address: "The American College of Physicians is the one national organization that offers useful service to all internists and to the general cause of internal medicine."

The annual meeting of the College, held at some important medical center, regularly attracts in large numbers the more reputable elements of the profession and affords a unique opportunity to those who partici-

pate in the program to present the results of their work before an audience fully competent to appreciate the value of real contributions to professional advancement. The annual sessions are so arranged that a part of each day is given over to visits to hospitals, clinics and demonstrations; while a part is spent in considering reports or addresses by members of the College and in the hearing of formal addresses by distinguished American and foreign guests and of the president's address.

In its organization the College of Physicians is essentially democratic and representative throughout. Annually there is elected by the entire membership of fellows present at the meeting of the College a Board of Governors, consisting of one member from each state, province, or country represented in the membership and present at the session. A Board of Regents, limited in numbers, is elected by the Governors, which conducts the business affairs of the College. The members of the present Board of Regents of the College attest the professional character of the Fellows of the American College of Physicians.

The official publication of the College, issued monthly, is called *The Annals of Clinical Medicine,* and affords an admirable opportunity to the Fellows contributing to our programs to secure the placing of their papers and addresses before a choice element of the medical profession.

Quoting the language of our Constitution, "Each individual elected to fellowship in the College is authorized and encouraged to use the letters F.A.C.P. after his name on professional cards, in professional directories, and in professional publications."

Summarizing, the possession of a Fellowship in The American College of Physicians indicates: (1) Graduation from a school of medicine acceptable to the Board of Regents. (2) Membership in good standing in local, state, and national societies. (3) License to practice regular medicine, or, if not a licentiate, that he is engaged in scientific medical research in an institution of recognized standing. (4) Personal and professional conduct becoming a gentleman and a member of a learned profession. (5) That application has been made to The College in due form, and the applicant regularly admitted. (6) That he is more than 26 years of age and the possessor of a degree in medicine granted at least five years prior to applying for membership in The College, and that he is not connected in any way whatever with any firm or institution engaged in improper exploitation of medical service or the results of medical research. (7) That, if not engaged in teaching in an institution of the first class or in charge of the medical service of an institution of recognized character with a minimum capacity of 100 beds, plus a personal service of twenty beds, or actively affiliated with the professional services of the United States or Canadian Army, Navy or Public Health Service, he shall have submitted in writing to the Regents fifty clinical reports upon patients who have actually been under his care, or in lieu thereof a thesis acceptable to the Regents.

In short, I believe I am perfectly safe in saying that there is perhaps no professional organization now existent in America around whose membership admission are thrown regulations more calculated to secure only physicians of the higher type. Such restrictions, I am equally certain, will continue, with the result that the letters "F. A. C. P." will be regarded throughout the world as a badge of medical efficiency.

EXECUTIVE COMMITTEE

The following Executive Committee was continued for the ensuing year: Dr. J. P. Munroe, chairman; Dr. W. O. Nisbet, Dr. L. B. McBrayer, secretary.

OFFICERS OF THE AMERICAN COLLEGE OF PHYSICIANS

President—Alfred Stengel ..... Philadelphia, Pa.
President Elect—Frank Smithies ..... Chicago, Ill.
First Vice-President—Aldred Scott Warthin ..... Ann Arbor, Mich.
Second Vice-President—Charles Martin ..... Montreal, Que.
Third Vice-President—Stewart R. Roberts ..... Atlanta, Ga.
Treasurer—Clement R. Jones ..... Pittsburgh, Pa.
Secretary-General—George Morris Piersol ..... Philadelphia Pa.
Executive Secretary—E. R. Loveland ..... Philadelphia, Pa.

REGENTS

John H. Musser, Jr.	New Orleans, La.	John Phillips	Cleveland, O.
Henry Plummer	Rochester, Minn.	W. McKim Marriott	St. Louis, Mo.
Lewellys F. Barker	Baltimore, Md.	Frederick Tice	Chicago, Ill.
F. M. Pottenger	Monrovia, Calif.	S. Marx White	Minneapolis, Minn.
John A. Lichty	Clifton Springs, N. Y.	Harlow Brooks	New York, N. Y.
Noble W. Jones	Portland, Ore.	Wm. Gerry Morgan	Washington, D. C.
Leonard M. Murray	Toronto, Ont.	Charles G. Lucas	Louisville, Ky.

EXECUTIVE COMMITTEE

Lewellys F. Barker, *Chairman*
Clement R. Jones
William Gerry Morgan
Leonard M. Murray
John Phillips
George Morris Piersol
F. M. Pottenger
Alfred Stengel

ROSTER OF MEMBERS FOR 1926

BY COUNTIES

NOTE.—Every physician in the state whose name we could secure has had an opportunity to supply correct information as to his name, postoffice, academic and medical education, date of State license and date State Society was joined. A few did not take advantage of the opportunity. Anyone finding an error should report it to the secretary of the society.

ALAMANCE-CASWELL COUNTIES SOCIETY

Name and Address	Licensed	Joined State Society
President: J. A. Pickett, Burlington, R. F. D. 1; Univ. of Tenn. Coll. of Med., 1894	1894	1904
Secretary: R. E. Brooks, Burlington; Jeff. Med Coll., 1920	1920	1922
Anderson, Chas. A., Burlington; Coll. P. and S., Balt., 1901	1893	1896
Brittle, Paul C., Burlington; Univ. Coll. of Med., Richmond 1907	1907	1910
Ellington, A. J., Burlington; Columbia Univ., 1915	1915	1917
Goley, Willard Coe, Graham; Univ. of Pa., 1924	1924	1924
Goley, Wm. R., Graham (Hon.); P. and S., Balt., 1885	1885	1893
Gwyn, H. L., Yanceyville; Med. Coll. Va., 1923	1923	1925
Harden, Graham, Burlington; Univ. of Pa., 1919	1920	1922
Kernodle, Chas. E., Elon College; Univ. of Md., 1911	1911	1920
McDade, B. B., Corbett, Rt. 1; Univ. of Md., 1918	1918	1920
McPherson, C. W., Burlington; Univ. of Md., 1910	1910	1912
McPherson, R. G., Saxapahaw; Univ. of N. C., 1908	1908	1909
Malloy, S. A., Yanceyville; Ky. School of Med., 1897	1898	1903
Montgomery, Harry M., Burlington; N. C. Med. Coll., 1903	1903	1904
Parker, John R., Burlington; Univ. Coll. of Med., Richmond, 1901	1901	1917
Scott, S. F., Union Ridge; Univ. of Pa., 1918	1918	1920
Simpson, H. H., Altamahaw; Univ. of Md., 1925	1925	1926
Spoon, Charles E., Burlington; Univ. of Tenn., 1907	1914	1920
Taylor, Jas. N., Graham; Med. Coll. of Va., 1901	1902	1905
Troxler, R. M., Burlington; Univ. of Md., 1914	1914	1915
Tyson, T. D., Mebane; Univ. Coll. of Med., Richmond, 1899	1899	1904
Walker, L. A., Burlington; Univ Coll. of Med., Va., 1898	1899	1905
Walker, Walter E., Burlington; Med. Coll. of Va., 1903	1903	1905
Walters, C. M., Burlington; Univ. of Md. and P. and S., Balt., 1908	1908	1909
Warren, R. F. Prospect Hill; Atlanta School of Med., 1911	1911	1919
Wilkins, J. C., Haw River; Univ. of Md., 1911	1911	1920

ANSON COUNTY

President:		
Secretary: Jno. E. Hart, Wadesboro; P. and S, Balt., 1897	1897	1904
Allen, Chas. I., Wadesboro; Col. Univ., Coll. P. and S., 1913	1913	1922
Bennett, Jos. H., Wadesboro; Univ. of Md., 1894	1894	1904
Covington, Platt W., Wadesboro; Univ. of Md., 1908	1908	1914
Davis, J. M., Wadesboro; Columbia Univ., 1913	1913	1920

Liles, N. P., Lilesville; Med. Coll. of S. C., 1911	1911	1911
McGoogan, Benj. J., McFarlan; Univ. of Md., 1912	1912	1923
Maynard, J. D., Wadesboro; Univ. of N. C., 1908	1908	1922
Moore, Henry B., Morven; Jeff. Med. Coll., 1920	1920	1923
Ross, Robert D., Wadesboro; N. Y. Univ., 1890	1890	1912

ASHE COUNTY SOCIETY

President:		
Secretary:		
Hagaman, J. B., Todd; Lincoln Mem. Univ., 1915	1915	1915
Jones, Thos. J., Lansing; Lincoln Mem. Univ., 1895	1889*	1885
Jones, T. Lester, Lansing; Va. Med. Coll., 1909	1909	1917
Ray, R. C., Beaver Creek; Med. Coll. of Va., 1916	1916	1917
Reeves, B. E., West Jefferson; P. and S., Balt., 1891	1891	1924
Robinson, W. J., Creston; Univ. Med. Coll., Kansas City, 1904	1907	1917

AVERY COUNTY SOCIETY

President: Eustace H. Sloop, Crossnore; N. C. Med. Coll., 1905, Jeff. Med. Coll., 1908	1905	1909
Secretary: W. B. Burleson, Plumtree; Univ. of Md., 1915	1915	1916
Hardin, R. H., Banner Elk; N. C. Med Coll., 1914	1914	1919
Proffitt, Thos. J., Elk Park; Univ. Louisville Med. Dept., 1903	1903	1914
Tate, W. C., Banner Elk; Tenn. Med. Coll., 1908	1909	1912

BEAUFORT COUNTY SOCIETY

President: J. C. Rodman (Hon.), Washington; Bellevue Med. Coll., 1892	1892	1895
Secretary: John Cotton Tayloe, Washington; Univ. of Pa. 1922	1924	1925
Bonner, J. B., Washington; Univ. of Md. School of Med. and Coll. P. and S., 1918	1918	1920
Brown, E. M., Washington; Bellevue Hosp. and Med. Coll., 1896	1896	1901
Carter, H. W., Washington; Univ. of Va., 1895	1895	1910
Harper, J. M., Aurora; Univ. of N. C., 1910	1910	1911
Jackson, C. C., Yeatsville; P. and S., Balt., 1893	1893	1896
Kafer, Oswald O., Edward; Univ. of Md., 1905	1905	1912
Nicholson, John L., Washington; Univ. of Md. and Coll. P. and S., 1904	1904	1904
Nicholson, P. A., Washington (Hon.); P. and S., Balt., 1889	1889	1890
Nicholson, Sam T., Washington (Hon.); P. and S., Balt., 1881	1885	1885
Swindell, Lewis H., Washington; Univ. of Pa., 1916	1916	1919
Tayloe, D. T., Washington, (Hon.); Bellevue Med. Coll., 1885	1885	1885
Tayloe, D. T., Jr., Washington; Univ. of Pa., 1919	1919	1922
Tayloe, Joshua, Jr., Washington; Univ. of Pa., 1923	1923	1926
Williams, John W., Washington; Univ. of Md., and Coll P. and S., 1906	1906	1906
Windley, C. T., Belhaven; P. and S. Balt., 1893	1893	1910

*Registered.

BERTIE COUNTY SOCIETY

President:		
Secretary: E. P. Norfleet, Roxobel; Va. Med. Coll., 1914	1914	1920
Castelloe, Cola, Windsor; Univ. of Pa., 1917	1917	1926
Evans, L. B., Windsor; Univ. Coll. of Med., 1900	1900	1907
Garriss, Frank H., Lewiston; Jefferson Med. Coll., 1912	1912	1918
Pritchard, John L., Windsor; P. and S., Balt., 1906	1906	1908
Sawyer, Charles Judson, Windsor (Hon.); P. and S., Balt., 1895	1895	1897
Smith, Jos. Elmer, Windsor; Va. Med. Coll., 1921	1921	1922
White, F. W. M., Lewiston	1924	1925

BLADEN COUNTY SOCIETY

President: R. S. Cromartie, Garland; N. C. Med. Coll., 1900	1900	1915
Secretary: E. S. Clark, Clarkton; Med. Coll. of Va., 1914	1914	1915
Bridger, D. H., Bladenboro; Jeff. Med. Coll., 1922	1922	1925
Bullard, G. F., Elizabethtown; N. C. Med. Coll., 1915	1915	1916
Clark, D. D., Clarkton; Med. Coll. of Va., 1917	1917	1920
Hutchinson, S. S., Bladenboro; N. C. Med. Coll., 1911	1911	1917
Singletary, G. C., Clarkton; Univ. of Pa. School of Med., 1917	1917	1918

BRUNSWICK COUNTY SOCIETY

President:		
Secretary:		
Goley, Wm. R., Shallotte; Univ. Coll. of Med., Richmond, 1901	1901	1904

BUNCOMBE COUNTY SOCIETY

President: F. W. Griffith, Asheville; Johns Hopkins, 1906	1911	1912
Secretary: M. S. Broun, Asheville; Columbia Coll. of P. and S., 1919	1922	1923
Adams, J. L., Asheville; Jeff. Med. Coll., 1910	1910	1913
Alexander, Geo., Asheville; Univ. of Louisville Med. Dept., 1913	1920	1921
Ambler, Arthur C., Asheville; Jeff. Med. Coll., 1920	1921	1922
Ambler, Chas. P., Asheville (Hon.); West. Reserve Univ. School of Med., 1889	1890	1891
Anderson, James G., Asheville; Univ. of N. C., 1906	1907	1910
Archer, Isaac J., Black Mountain; Northwestern Univ. Med. Sch., 1896	1905	1907
Baker, W. E., Arden; Chattanooga Med. Coll., 1908	1915	1916
Battle, Geo. C., Asheville; Univ. of Md., 1912	1912	1912
Battle, S. W., Asheville (Hon.); Bellevue Med. Coll., N. Y., 1875	1889*	1887
Beall, L. G., Black Mountain; N. C. Med. Coll., 1906; Univ. of Pa., 1911	1906	1912
Bown, Herbert H., Asheville; Columbus Med. Coll., 1892	1917	1918
Briggs, Henry H., Asheville; Yale Univ. School of Med., 1897	1901	1903
Brookshire, Harley G., Asheville; N. C. Med. Coll., 1905	1905	1907
Brownson, Wm. C., Asheville (Hon.); Univ. of N. Y., 1878	1881	1885
Carroll, Jno. L., Asheville; Louisville Med. Coll., 1905	1905	1905
Chambers, P. P., Asheville; Med. Coll. of S. C., 1907	1922	1923
Cheesborough, Thos. P., Asheville; Univ. of N. Y. 1891	1891	1900

*Registered.

Clark, Harold S., Asheville; Univ. of Pa., 1922	1922	1924
Cocke, C. H., Asheville; Cornell Univ., 1905	1912	1913
Cocke, E. R., Asheville; Jeff. Med. Coll., 1913	1914	1917
Cocke, Jere E., Asheville; Louisville Med. Coll., 1905	1905	1907
Colby, C. DeW., Asheville; Univ. of Mich., 1892; Army Med. Sch., 1895	1909	1912
Cotten, Clyde E., Asheville; Univ. of Wooster, 1889	1901	1901
Craddock, Alva B., Asheville; Johns Hopkins, 1918	1923	1924
Denchfield, A. L., Asheville; Univ. of N. Y., 1905	1914	1916
Dunn, Wm. L., Asheville; Univ. of Mich., 1891	1900	1900
Eckel, O. F., Asheville; Med. Coll. of S. C., 1906	1907	1909
Edwards, B. O., Asheville; N. C. Med. Coll., 1905	1905	1909
Edwards, C. P., Asheville; Tenn. Med. Coll., 1900	1903	1921
Elias, Lewis W., Asheville; Columbia Univ. Coll. of P. and S., 1903	1906	1907
Folsom, T. W., Asheville; Univ. of Pa., 1921	1921	1923
Frazer, H. Thompson, Asheville; Columbia Univ. Coll. P. and S., N. Y., 1901	1908	1909
Godwin, G. C., Oteen; Med. Coll. Va., 1915	1915	1920
Grantham, Wm. L., Asheville; N. C. Med. Coll., 1906	1906	1911
Greene, Jos. B., Asheville; Univ. of Va., 1893	1910	1911
Greenwood, A. B., Asheville; Johns Hopkins, 1916	1916	1918
Griffin, M. A., Asheville; Jeff. Med. Coll., 1917	1917	1918
Griffin, W. R., Asheville; Jeff. Med. Coll., 1910	1910	1917
Griffith, L. M., Asheville; Johns Hopkins, 1915	1916	1917
Harrison, H. H., Asheville; Jeff. Med. Coll., 1905	1905	1918
Herbert, Wm. P., Asheville; Univ. of Va., 1907	1910	1911
Hipps, A. G. T., Asheville; Jeff. Med. Coll., 1916	1916	1920
Hollyday, W. M., Asheville; Univ. of Maryland, 1908	1914	1915
Huffines, T. R., Asheville; Indiana Univ. Med. Sch., 1919	1922	1923
Hunnicutt, Wm. J., Asheville; Univ. of Tenn., 1895	1908	1909
Huston, John Walter, Asheville; Rush Med. Coll., Chicago, 1904	1912	1913
Ivey, R. R., U. S. P. H. S., Biltmore; Univ. of Ala., 1909	1921	1921
Jordan, Charles S., Asheville; Univ. of N. Y., 1890	1891	1899
King, Edward, Asheville; Harvard, 1917	1921	1922
Knoefel, A. E., Black Mountain; Univ. of Louisville, 1893	1914	1916
Kutscher, G. W., Jr., Swannanoa; Univ. of Pittsburgh, 1923	1925	1926
Lord, Marjery J., Black Mountain; Univ. of Mich., 1916	1918	1918
Lynch, J. M., Asheville; Univ. of Md., 1904	1912	1913
MacPherson, G. S., Asheville; Medical School of Harvard Univ., 1894	1919	1920
MacRae, J. D., Asheville; Univ. of Nashville, 1897	1899	1920
McCall, A. C., Asheville; Univ. of Md., 1910	1910	1912
McCracken, C. M., Fairview; N. C. Med. Coll., 1896	1896	1904
Malone, J. Y., Asheville; Wash. Univ., 1921	1924	1924
Meriwether, Benj. Morsell, Asheville; U. of Louisville, 1915	1915	1924
Millander, Chas. W., Asheville; Tulane Univ., 1919	1921	1924
Minor, Chas. L., Asheville; Univ. of Va., 1888	1895	1898

Morgan, B. E., Asheville; Univ. of Tenn., 1917	1921	1921
Morgan, G. A., Asheville; Univ. of Tenn., 1917	1920	1925
Norburn, Chas. S., Asheville; Univ. of Va., 1917	1921	1924
Orr, Chas. C., Asheville; Univ. of Md., 1904	1904	1905
Orr, P. B., Asheville; Jeff. Med. Coll., 1901	1901	1904
Parker, Geo. F., Asheville; Univ. of Pa., 1923	1924	1926
Pendleton, Wilson, Asheville; Univ. of Va., 1908	1919	1920
Pritchard, Arthur T., Asheville; Jeff. Med. Coll., 1905	1905	1907
Pritchard, G. L., Black Mountain; Univ. Coll. of Med., Richmond, 1913	1913	1926
Reeves, A. F., Asheville; Geo. Washington Univ., 1906	1909	1910
Reeves, R. J., Leicester; Vanderbilt Univ., 1913	1913	1922
Reynolds, C. V., Asheville (Hon.); Univ. of N. Y., 1895	1895	1896
Richardson, F. H., Black Mountain; Cornell Univ. Med. Coll., 1906	1919	1920
Ringer, Paul H., Asheville; Columbia Univ. P. and S., N. Y., 1904	1906	1907
Schoenheit, E. W., Asheville; Jeff. Med. Coll., 1920	1920	1921
Scott, R. C., Asheville; Jeff. Med. Coll., 1902	1916	1919
Scruggs, W. H., Asheville; Univ. of Md., 1913	1915	1917
Sevier, D. E., Asheville; Jeff. Med. Coll., 1895	1895	1899
Sevier, J. T., Asheville; Jeff. Med. Coll., 1895	1895	1899
Smith, B. R., Asheville; Jeff. Med. Coll., 1911	1913	1914
Sprinkle, C. N., Weaverville; Jeff. Med. Coll., 1910	1910	1922
Stevens, M. L., Asheville (Hon.); Balt. Med. Coll., 1891	1892	1893
Tennent, G. S., Asheville; N. C. Med. Coll., 1894	1894	1898
Terry, P. R., Asheville; George Washington Univ., 1907	1912	1913
Thompson, A. C., Asheville; Georgetown Univ., 1911	1921	1922
Toole, A. F., Asheville; Univ. of Va., 1900	1917	1918
Wanstrom, Ruth, Asheville; Univ. of Mich., 1918	1920	1926
Watkins, John A., Asheville; Tulane University, 1910	1925	1926
Ward, John LaB., Asheville; Med. Coll. of S. C., 1905	1921	1922
Weaver, H. B., Asheville (Hon.); Washington Univ., Balt., 1872	1881	1882
Weaver, W. J., Asheville; Jeff. Med. Coll., 1898	1897	1915
White, R. A., Asheville; Univ. Cin. Coll. of Med., 1918	1920	1921
Whittington, W. P., Asheville (Hon.); P. and S., Balt., 1882	1882	1882
Wier, J. E., Asheville; Indiana University, 1913	1925	1926
Wiest, Paul F., Asheville; University of Md., 1921	1925	1925
Willis, A. P., Candler; Univ. of N. C., 1904	1904	1919
Wilson, R. G., Biltmore; Univ. of Pa., 1919	1919	1921
Woodcock, John H., Hendersonville; Hosp. Coll. of Med., Louisville, 1892	1894	1899
Wright, J. B., Black Mountain; Univ. of Ga., 1889	1899	1924

BURKE COUNTY SOCIETY

President: W. H. Kibler, Morganton; Univ. of Pa., 1914	1914	1918
Secretary: G. M. Billings, Morganton; Tulane Univ. of La., 1919	1919	1920
Kirksey, James J., Morganton; Univ. of Pa., 1921	1921	1923

Long, Benj. L., Glen Alpine; N. C. Med. Coll., 1913	1913	1914
Long, R. H., Morganton; Jeff. Med. Coll., 1916	1916	1923
McCampbell, John, Morganton; Balt. Med. Coll., 1894	1895	1899
Phifer, Edward M., Morganton; N. C. Med. Coll., 1902	1902	1904
Riddle, J. B., Morganton; Vanderbilt Univ., 1898	1904	1904
Taylor, E. H. E., Morganton; Tulane Univ. La., 1924	1924	1925
Vernon, Jas. W., Morganton; Jeff. Med. Coll., 1909	1909	1913
Watkins, F. B., Morganton; Jeff. Med. Coll., 1907	1907	1910

CABARRUS COUNTY SOCIETY

President:		
Secretary: J. A. Hartsell, Concord; Jeff. Med. Coll., 1912	1914	1916
Bangle, J. A., Concord; N. C. Med. Coll., 1916	1916	1919
Buchanan, S. E., Concord; N. C. Med. Coll., 1912	1912	1914
Bunn, J. J., Mt. Pleasant; N. C. Med. Coll., 1912	1913	1915
Burleyson, L. N., Concord; Univ. of Md., 1891	1891	1906
Caldwell, D. G., Concord; Univ. of Pa., 1923	1925	1925
Cauble, H. H., Kannapolis; N. C. Med. Coll., 1909	1909	1911
Flowe, R. Frank, Kannapolis; N. C. Med. Coll., 1913	1914	1915
Gouger, Geo. J., Concord; Univ. of Md., 1891	1891	1899
King, Richard M., Concord; Jeff. Med. Coll., 1903	1903	1907
Lubchenko, N. E., Harrisburg; N. C. Med. Coll., 1915	1915	1916
MacFadyen, Paul R., Concord; Univ. Coll. of Med., Richmond, 1901	1901	1904
Nolan, J. V., Kannapolis; Jeff. Med. Coll., 1921	1921	1922
Patterson, John A., Concord; Univ. Coll. of Med., Richmond, 1911	1911	1912
Pemberton, Wm. D., Concord (Hon); Univ. of Md., 1887	1887	1887
Rankin, R. B., Kannapolis; Tulane Univ. of La., 1917	1920	1922
Reed, John F., Concord; Univ. of N. Y., 1893	1907	1912
Smoot, J. E., Concord; Balt. Med. Coll., 1893	1894	1902
Sossoman, J. C., Midland; N. C. Med. Coll., 1915	1917	1918
Wadsworth, Wm. H., Concord; Jeff. Med. Coll., 1913	1913	1913
Yow, I. A., Georgeville; N. C. Med. Coll., 1906	1906	1910

CALDWELL COUNTY SOCIETY

President: Albert Houck, Lenoir (Hon.); P. and S. Balt., 1884	1891	1893
Secretary: W. M. White, Lenoir; Atlanta P. and S., 1899	1899	1905
Coffey, Lawrence H., 911 E. Main St., Lakeland, Fla.; Va. Med. Coll., 1906	1906	1913
Corpening, O. J., Granite Falls; Univ. Coll. of Med., Va., 1906	1906	1907
Goodman, A. B., Lenoir; N. C. Med. Coll., 1898	1897	1910
Hedrick, Clyde R., Lenoir; Georgetown Med. School, 1925	1925	1926
Hickman, M. T., Hudson; Univ. of Va., 1909	1909	1910
Kent, Alfred A., Winter Pk., Fla.; Jeff. Med. Coll., 1885	1885	1900
McNairy, Caroline, Lenoir; Woman's Med. Coll., Pa., 1917	1917	1919
McNairy, C. Banks, Lenoir; P. and S. Balt., 1893	1893	1905
Pitts, W. I., Lenoir; Univ. of the South, Sewanee, 1903	1911	1913
Rudisill, J. D., Lenoir; Univ. of Md., 1922	1922	1923

Russell, C. R., Granite Falls; Univ. Coll. of Med., Richmond, 1909	1909	1918
Wilson, Clarence L., Lenoir; U. S. Grant Univ., 1903	1903	1905

CARTERET COUNTY SOCIETY

President:		
Secretary: Bonner, K. P. B., Morehead City; Med. Coll. of Va., 1905	1905	1905
Braswell, Wm. Edgar, Marshallberg; Univ. of Ga., 1907	1925	1926
Britt, T. C., Beaufort; Jeff. Med. Coll., 1921	1921	1925
Davis, George, Beaufort; Kentucky School of Med., 1894	1896	1904
Davis, J. J., Marshallberg; Univ. of Md., 1891	1891	1916
Ferebee, C. G., Morehead City; Med. Coll. of Va., 1902	1904	1904
Hyde, Francis Edward, Beaufort; West. Res. Univ., 1920	1925	1926
Mason, Manly, Newport; Tulane University, 1924	1924	1925
Maxwell, C. S., Beaufort; Univ. of the South, Sewanee, 1900	1899	1904
Royal, Ben F., Morehead City; Jeff. Med. Coll., 1909	1909	1909
Thompson, S. W., Jr., Morehead City; Va. Med. Coll., 1913	1915	1922
Whitehurst, E. B., Beaufort; Med. Coll. Va., 1915	1917	1920

CASWELL COUNTY SOCIETY

(See Alamance-Caswell)

CATAWBA COUNTY SOCIETY

President: H. C. Menzies, Hickory; N. C. Med. Coll., 1894	1894	1899
Secretary: Robt. T. Hambrick, Hickory; Univ. of Tulane, 1923	1923	1924
Bandy, W. G., Maiden; Vanderbilt Univ., 1908	1912	1916
Blackburn, T. C., Hickory; Balt. Med. Coll., 1896	1896	1909
Cochrane, J. D., Newton; Univ. of Md., 1912	1912	1923
Flippin, J. M., Hickory; Coll. P. and S. Md., 1884	1893*	1926
Flowers, G. E., Hickory; Sou. Med. Coll., Atlanta, 1884	1889*	1904
Foard, F. T., Hickory; Louisville Med. Coll., 1886	1886	1904
Frye, Glenn R., Hickory; Jeff. Med. Coll., 1921	1921	1923
Klutz, A. F., Maiden; Jeff. Med. Coll., 1917	1917	1920
Long, Fred Y., Catawba; Balt. Med. Coll., 1898; N. C. Med. Coll.,	1898	1898
Long, Glenn, Newton; N. C. Med. Coll., 1912	1912	1915
Menzies, H. H., Hickory; Med. Coll. Va., Richmond, 1923	1923	1926
Nowell, S. C., Hickory; Univ. of Pa., 1921	1922	1924
Shuford, Jacob H., Hickory; Univ. of Mich., 1901	1902	1902
Speas, W. P., Hickory; Univ. of Maryland, 1911	1911	1919

CHATHAM COUNTY SOCIETY

President: J. D. Edwards, Siler City (Hon); Louisville Med. Coll,. 1887		1894
Secretary: J. R. Howard, Bonlee; Med. Coll. of Va., 1924	1924	1925
Cathel, J. E., Moncure; Univ. of Md., 1899	1902	1906
Denson, H. A., Bennett; Central Coll. P and S., Indianapolis, 1887	1913	1913

*Registered.

Gyles, Ronald C., Siler City; Jeff. Med. Coll., 1917	1922	1924
Thomas, W. C., Siler City; Va. Med. Coll., 1917	1917	1920
Upchurch, C. G., Apex; Univ. of Md., 1906	1907	1922

CHEROKEE COUNTY SOCIETY

President: B. G. Webb, Andrews; Louisville Med. Coll., 1885	1885	1885
Secretary: Wm. C. Morrow, Andrews; Atlanta School of Med., 1909	1909	1909
Adams, Edw. E., Murphy; Jeff. Med. Coll., 1923	1923	1924
Adams, N. B., Murphy; Tenn. Med. Coll., 1896	1909	1909
Herbert, Fred L., Andrews; Tenn. Med. Coll., 1904	1912	1912
Highway, S. C., Murphy; Med. Coll. of Ohio, 1885	1904	1898
Hill, J. N., Murphy; Univ. of Louisville, 1909	1909	1909
Tidwell, J. E., Andrews; Chattanooga Med. Coll., 1903	1909	1915
Young, G. McD., Postell; Lincoln Mem. Univ., 1916	1917	1918

CHOWAN-PERQUIMANS COUNTIES SOCIETY

President:		
Secretary:		
Blanchard, T. W., Hobbsville; Med. Coll. of Va., 1911	1911	1919
Cox, Thomas A., Hertford; Univ. of Md., 1885	1907	1918
Davenport, C. A., Hertford; Univ. of Md., 1924	1924	1926
Dillard, Richard, Jr., Edenton (Hon.); Jeff. Med. Coll., 1879	1880	1880
Powell, Jesse A., Edenton; Coll. Phys. and Surg., Balt., 1907	1908	1909
Smith, Robt. W., Hertford; Univ. of Md., 1892	1892	1918
Warren, John W., Edenton; Univ. Coll. Med., Richmond, 1907	1907	1926
Whichard, M. P., Edenton; Univ. of Md., 1910	1910	1918
Williams, L. P., Edenton; Bellevue Med. Coll., 1918	1919	1921

CLEVELAND COUNTY SOCIETY

President: W. F. Mitchell, Shelby; Univ. of Md., 1889	1900	1904
Secretary: Sam M. Schenk, Shelby; Univ. of Pa., 1923	1923	1926
Aydlette, Jos. P., Earl; Kentucky University, 1901	1903	1903
Ellis, R. C., Shelby (Hon.); Balt. Univ. Med. School, 1886	1889*	1891
Gibbs, E. W., Shelby; Univ. of N. C., 1907	1907	1918
Gold, Ben, Shelby; P. and S., Balt., 1920	1920	1922
Gold, T. B., Shelby; N. C. Med. Coll., 1911	1911	1915
Hamrick, J. Y., Jr., Boiling Springs; Columbia Univ., 1915	1915	1917
Hamrick, T. G., Shelby; P. and S., Balt., 1895	1895	1904
Harbison, J. W., Shelby; Johns Hopkins, 1919	1919	1924
Hord, J. G., Kings Mountain; Univ. of Louisville, 1891	1894	1926
Houser, E. A., Shelby; Chattanooga Med. Coll., 1898; Balt. Univ., 1902	1902	1904
Lackey, F. H., Fallston; Univ. of Md., 1915	1915	1920
Lattimore, E. B., Shelby; Bellevue Med. Coll., 1897	1896	1904
Lee, Lawrence V., Lattimore; Emory Univ. School of Med., 1894	1897	1904
McBrayer, R., Shelby; Univ. of Pa., 1916	1916	1917
Oates, George, Grover; Univ. of Louisville, 1894	1902	1904

*Registered.

Royster, S. S., Shelby; Tenn. Med. Coll., 1891	1896	1904
Wood, J. W., Boiling Springs; Louisville Med. Coll., 1892	1901*	1900

COLUMBUS COUNTY SOCIETY

President: G. S. Cox, Tabor; N. C. Med. Coll., 1911	1911	1914
Secretary: Floyd Johnson, Whiteville; Memphis Hosp. Med. Coll., 1903	1903	1904
Baggett, Leaman, Whiteville; N. C. Med. Coll., 1907	1907	1909
Barefoot, Graham B., Chadbourn; Jefferson Med. Coll., 1923	1923	1924
Crowell, W. H., Whiteville; Univ. of Md., 1895	1895	1908
Floyd, L. D., Cerro Gordo; N. C. Med. Coll., 1911	1911	1912
Formyduval, T., Bolton; Va. Med. Coll., 1919	1920	1922
Maxwell, H. B., Whiteville; Univ. of Md., 1902	1902	1902
Moore, T. V., Acme; Balt. Med. Coll., 1901	1901	1911
Roberts, Bryan N., Boardman; Univ. of Md. Sch. Med., 1925	1925	1926
Sadler, R. C., Whiteville; N. C. Med. Coll., 1912	1912	1915
Smith, W. F., Chadbourn; N. C. Med. Coll., 1904	1904	1905
Whitaker, R. B., Whiteville; Univ. Coll. of Med., Richmond, 1912	1912	1913
Williams, Wm. Norman, Tabor; Med. Coll. of Va., 1924	1924	1925

CRAVEN COUNTY SOCIETY

President: R. L. Daniels, New Bern; Med. Coll. of Va., 1912	1912	1919
Secretary: Barker, Christopher S., New Bern; Jeff. Med. Coll., 1909	1909	1924
Ball, M. W., New Bern; Atlanta Sch. of Med., 1909	1909	1913
Caton, Geo. A., New Bern; Va. Med Coll., 1898	1898	1904
Duffy, R. N., New Bern; Johns Hopkins, 1906	1907	1908
Duffy, Leinster, New Bern; P. and S. Baltimore, 1889	1888	1888
Duguid, James, Vanceboro; N. C. Med. Coll., 1905	1906	1912
Ford, D. E., New Bern; Univ. of Mich., 1908	1925	1924
Gibbs, N. M., New Bern; Univ. of Md. and Coll. P. and S., Balt., 1896	1895	1897
Jones, R. Duval, New Bern; Univ. of Md., 1896	1897	1897
Latham, Joseph R., New Bern; Jeff. Med. Coll., 1917	1917	1923
Patterson, Joseph F., New Bern; Jeff. Med. Coll., 1906	1906	1906
Pollock, Raymond, New Bern; Jefferson Med. Coll., 1897	1900	1900
Primrose, R. S., New Bern; Bellevue, 1890	1890	1925
Taylor, H. A., New Bern; Univ. of Ala., 1912	1923	1924
Wadsworth, H. B., New Bern; Johns Hopkins, 1918	1918	1923

CUMBERLAND COUNTY SOCIETY

President: T. M. West, Fayetteville; Univ. of Md., 1908	1910	1910
Secretary: O. L. McFadyen, Fayetteville; N. C. Med. Coll., 1912	1912	1912
Allgood, R. A., Fayetteville; Univ. of Md. and Coll. of P. and S., Balt., 1912	1915	1917
Averitt, K. G., Cedar Creek; Balt. Med. Coll., 1893	1893	1902
Blakey, R. A., Fayetteville; Med. Coll. of Va., 1924	1925	1925
Bullock, Thomas C., Autryville; P. and S., Balt., 1885	1885	1905
Chester, P. J., Fayetteville; N. C. Med. Coll., 1913	1913	1920

*Registered.

Coburn, Major H. C., Jr., Fort Bragg; Columbian (Geo. Wash.), 1903	.....	1925
Cook, H. L., Fayetteville; Jeff. Med. Coll., 1918	1918	1920
Currie, D. S., Parkton; N. C. Med. Coll., 1906	1906	1907
Duggins, Major P. E., Fort Bragg; Univ. of Va., 1913	.....	1924
Gainey, John W., Fayetteville; Jeff. Med. Coll., 1917	1917	1921
Highsmith, J. D., Fayetteville; Jeff. Med. Coll., 1918	1918	1920
Highsmith, J. F., Fayetteville (Hon.); Jeff. Med. Coll., 1889	1889	1893
Highsmith, Seavy, Fayetteville; Univ. Coll. of Med., Richmond, 1901	1901	1902
Jordan, Wm. S., Fayetteville; Univ. of N. C., 1906	1906	1907
Lilly, James M., Fayetteville; Univ. Coll. of Med., Richmond, 1903	1903	1904
McAndrew, Lt. Col. P. H., Fort Bragg; Univ. of Pa., 1893	.....	1924
McGougan, J. V., Fayetteville; Univ. of Md. and Coll. of P. and S., 1893	1893	1909
McKay, W. P., Fayetteville; Tulane Univ., 1916	1916	1921
McNeill, Jas. Wm., Fayetteville (Hon.); Bellevue Med. Coll., 1876	1876	1876
Olive, P. W., Fayetteville; P. and S., Balt., 1907	1907	1909
Pittman, R. L., Fayetteville; Jefferson Med. Coll., 1910	1910	1912
Rainey, W. T., Fayetteville; Univ. Coll. of Med., Richmond, 1913	1913	1916
Robertson, J. N., Fayetteville; Med. Coll. of Va., 1923	1923	1924
Shaw, J. A., Fayetteville; Univ. Pa., 1923	1923	1926
Verdery, W. C., Fayetteville; Univ. of Ga., 1915	1920	1921
Von Zelinski, Maj. W. F., Fort Bragg; Bennett Med. Coll., Chicago, 1908	.....	1924

CURRITUCK COUNTY SOCIETY

President: J. M. Newbern, Jarvisburg; Georgetown Univ., Washington, 1898	1899	1900
Secretary: S. M. Mann, Moyock; P. and S., Balt., 1895	1895	1904
Cowell, Wm. H., Shawboro; Ky. School of Med., 1893	1909	1911
Griggs, W. T., Poplar Branch; Univ. of Va., 1896	1896	1901

DAVIDSON COUNTY SOCIETY

President: Frank Lowe Mock, Lexington, Rt. 3; N. C. Med. Coll., 1908	1908	1911
Secretary: Grover C. Gambrell, Lexington; Univ. of Ga., 1912	1923	1924
Buchanan, E. J., Lexington; Univ. of Md., 1892	1892	1900
Clodfelter, C. M., Lexington; P. and S., Balt., 1905	1905	1907
Clyatt, Claude Eugene, Denton; Univ. of Ga., 1911	1923	1924
Hill, W. Lee., Lexington, Rt. 4; P. and S., Balt., 1893	1893	1904
Hobgood, J. E., Thomasville; Jeff. Med. Coll., 1907	1907	1917
Hunt, W. Bryce, Lexington; Univ. of Md., 1923	1923	1924
Jennings, R. G., Thomasville; N. C. Med. Coll., 1913	1913	1920
Julian, Chas. A., Thomasville (Hon.); Louisville Med. Coll., 1888	1891	1892

Lancaster, F. J., Lexington; Jeff. Med. Coll., 1922	1922	1924
Phillips, C. H., Thomasville; Balt. Univ. School of Med., 1892	1893	1911
Sharpe, C. R., Lexington; Jeff. Med. Coll., 1914	1914	1917
Smith, J. A., Lexington; N. C. Med. Coll., 1915	1915	1917
Sowers, Jacob L., Lexington; Univ. of Md., 1921	1921	1924
Terry, J. R., Lexington; Univ. of Louisville, 1911	1912	1912
Vestal, Willis J., Lexington (Hon.); P. and S., Balt., 1883	1889*	1893
Yokeley, R. V., Thomasville; N. C. Med. Coll., 1911	1911	1912
Zimmerman, Robt. U., Lexington, Rt. 4; N. C. Med. Coll., 1901	1901	1904

DAVIE COUNTY SOCIETY

President: W. C. Martin, Mocksville; P. and S., Balt., 1888	1888	1904
Secretary: A. B. Byerly, Cooleemee; Univ. College of Med., Richmond, 1896	1896	1904
Martin, Lester P., Mocksville; Jeff. Med. Coll., 1920	1920	1921
Rodwell, Jno. W., Mocksville; P. and S., Balt., 1895	1895	1896

DUPLIN COUNTY SOCIETY

President: J. W. Farrior, Warsaw; Univ. of Pa., 1912	1913	1917
Secretary: J. W. Straughan, Warsaw; Med. Coll. of Va., 1924	1924	1925
Carr, Ransom Lee, Rose Hill; Balt. Med. Coll., 1907	1908	1909
Carroll, John W., Wallace; Univ. of Md., 1903	1903	1903
Kennedy, Geo. W., Beulaville; Univ. Coll. of Med., Richmond, 1898	1897	1909
Landen, J. F., Chinquapin; Univ. Coll. of Med., Richmond 1905	1905	1907
Maxwell, J. F., Pink Hill	1889*	1917
Morton, J. X., Faison; N. C. Med. Coll., 1915	1915	1922
Quinn, Robert F., Magnolia; N. C. Med. Coll., 1912	1913	1916
Reed, D. H., Kenansville; Geo. Washington Univ., 1901	1904	1917
Robinson, J. D., Wallace; Univ. of Md., 1915	1915	1917
Williams, Jas. M., Warsaw; Univ. of Md., 1902	1902	1902
Williams, R. C., Wallace; Univ. of Md., 1912	1915	1916

DURHAM-ORANGE COUNTIES SOCIETY

President: J. A. Speed, Durham; Jeff. Med. Coll., 1914	1914	1916
Secretary: H. M. Brinkley, Durham; Jeff. Med. Coll., 1919	1919	1923
Abernethy, E. A., Chapel Hill; Univ. Coll. of Med., Richmond, 1901; Geo. Wash. Univ., 1903	1901	1914
Adams, C. A., Durham; P. and S., Balt., 1892	1892	1901
Adkins, M. T., Durham; Johns Hopkins, 1907	1915	1916
Baynes, R.H., Durham; Univ. of Md., 1914	1914	1920
Bitting, Numa D., Durham; Jeff. Med. Coll., 1907	1907	1909
Boddie, Needham P., Durham (Hon.); P. and S., Balt., 1883	1883	1883
Booker, Lyle S., Durham; Va. Univ. Med. Coll., 1908	1910	1911
Boone, W. H., Durham; N. C. Med. Coll., 1902	1902	1910
Boone, W. W., Durham; Jeff. Med. Coll., 1923	1923	1925
Bowles, Francis N., Durham; Med. Coll. of Va., 1924	1924	1926
Brooks, B. U., Durham; Univ. of Md., 1905	1905	1907

*Registered.

Bullitt, J. B., Chapel Hill; Univ. of Va., 1897	1914	1915
Campbell, A. S., Durham; Chicago Coll. Med. and Surg., 1917	1923	1924
Carrington, G. L., Durham; Johns Hopkins, 1920	1920	1925
Coppridge, W. M., Durham; Jeff. Med. Coll., 1918	1919	1920
Darden, O. B., Westbrook Sanatorium, Richmond, Va.; Med. Coll. of Va., 1918	1920	1920
Fassett, Burton W., Durham; Balt. Med. Coll., 1898	1899	1909
Felts, Robert L., Durham; Univ. of Md., 1898	1899	1909
Graham, Joseph, Durham; Univ. of Pa., 1901	1902	1906
Hardee, W. P., Durham; Jeff. Med. Coll., 1912	1912	1924
Hayes, R. B., Hillsboro; Univ. of Md., 1906	1910	1917
Hicks, Calvin S., Durham; Univ. of Md., 1904	1904	1904
Holloway, O. W., Durham; Med. Coll. of Va., 1901	1901	1917
Holloway, Robt. Lee, West Durham; Va. Med. Coll., 1893	1893	1901
Hunter, Norman C., Durham; Medico-C. of Phila., 1897	1899	1904
Johnson, N. M., Durham (Hon.); Wash. Univ. Sch. of Med. 1877	1889*	1879
Kerns, T. C., Durham; Univ. of Pa., 1911	1911	1912
Lawson, R. B., Chapel Hill; Univ. of Va., 1903	1915	1920
Lloyd, B. B., Chapel Hill; Univ. of N. C., 1909	1909	1914
MacNider, Wm. deB., Chapel Hill; Univ. of N. C., 1903	1903	1903
McCutcheon, W. B., Durham; Med. Coll. of Va., 1921	1921	1924
McPherson, S. D., Durham; Univ. of Md., 1903	1903	1912
Mangum, C. S., Durham; Jeff. Med. Coll., 1894	1896	1898
Manning, I. H., Chapel Hill; Long Island, N. Y., Coll. Hosp., 1897	1899	1901
Manning, Jno. M., Durham (Hon.); Bellevue Med. Coll., 1882	1884	1884
Markham, Blackwell, Durham; Harvard Med. Coll., 1922	1922	1925
Montague, S. J., Durham; Bellevue Hosp. Med. Coll., 1872	1880	1922
Nichols, Rhodes E., Durham, Rt. 8; Va. Med. Coll., Rich., 1890	1890	1904
Patrick, J. E., Bahama; Univ. Coll. of Med., Va., 1900	1900	1917
Perry, D. R., Durham; Jeff. Med. Coll., 1919	1919	1922
Powell, Albert H., Durham; Univ. of Ga., 1924	1925	1925
Purinton, H. H., Durham; Bowdoin College, 1891	1914	1925
Riggsbee, A. E., Durham; Univ. of N. C., 1909	1909	1911
Roberson, Foy, Durham; Jeff. Med. Coll., 1909	1909	1912
Ross, Geo. H., East Durham; Univ. of Tenn., 1899	1899	1904
Ross, Robert A., Durham; Univ. of Pa., 1922	1922	1925
Schuler, J. E., East Durham; Med. Coll. of Va., 1914	1920	1922
Smith, Annie T., Durham; Univ. of Ill., 1923	1925	1926
Smith, F. C., Durham; Jeff. Med. Coll., 1921	1921	1925
Stanford, Lois Foote, Durham; Univ. of Pa., 1921	1923	1924
Stanford, W. R., Durham; Univ. of Pa., 1919	1919	1923
Stoner, I. J., West Durham; Memphis Med. Coll., 1898	1921	1922
Strowd, W. A., Durham; Univ. of N. C., 1909	1909	1926
Sweaney, H. M., Durham; Univ. of Pa., 1919	1919	1920
Toy, Calvert R., Chapel Hill; Univ. of Pa., 1923	1923	1926
Waring, E. S., Durham; Harvard, 1918	1922	1923
Watkins, W. M., Durham; Jeff. Med. Coll., 1923	1923	1925
Watkins, G. T., Durham; Jeff. Med. Coll., 1915	1915	1917

*Registered.

EDGECOMBE COUNTY SOCIETY

President: Wm. W. Green, Tarboro; Univ. of N. C., 1908	1908	1910
Secretary: T. E. Tucker, Tarboro; Univ. of Ala. Dep. of Med., 1920	1926	1926
Baker, J. M., Tarboro (Hon.); Univ. of Md., 1879	1879	1879
Barber, Y. M., Macclesfield; Univ. of Md., 1914	1917	1918
Bass, Spencer P., Tarboro; Univ. of Va., 1906	1907	1909
Harrell, Samuel N., Tarboro; Univ. of Md., 1897	1897	1904
Lane, M. E., Pinetops; Jeff. Med. Coll., 1921	1921	1922
Norfleet, L. E., Tarboro; Columbia Univ. P. and S., 1889	1890	1920
Raby, J. G., Tarboro; Univ. Coll. of Med., Va., 1911	1911	1912
Royster, Thos. H., Tarboro; Univ. Coll. of Med., 1908	1908	1914
Thigpen, William J., Tarboro; Jeff. Med. Coll., 1900	1900	1901
Wooten, Amos Monroe, Pinetops; Univ. of N. C., 1910	1910	1911

FORSYTH COUNTY SOCIETY

President: John Kerr Pepper, Winston-Salem; P. and S. Balt., 1907	1908	1908
Secretary: T. C. Redfern, Winston-Salem; L. I. Med. Coll. Hosp., 1916	1921	1921
Belton, J. F., Winston-Salem; Univ. of Pa., 1914	1914	1916
Benbow, J. T., Winston-Salem; N. C. Med. Coll., 1910	1910	1920
Bowers, M. A., Winston-Salem; Tulane Univ., 1911	1911	1914
Butler, Leroy J., Winston-Salem; Med. Coll. of Va., 1915	1920	1921
Bynum, John, Winston-Salem (Hon.); Univ. of N. Y., 1892	1892	1893
Carlton, Romulus L., Winston-Salem; Univ. of Md., 1906	1906	1908
Cooke, G. C., Winston-Salem; Univ. of Md., 1919	1919	1920
Couch, V. F., Winston-Salem; P. and S., New York, 1911	1911	1919
Craig, S. D., Winston-Salem; Tulane Univ., 1908	1911	1912
Dalton, D. N., Winston-Salem (Hon.); Univ. of N. Y., 1881	1885	1885
Dalton, Wm. N., Winston-Salem; N. C. Med. Coll., 1904	1904	1805
Daugherty, J. E., Brooklyn, N. Y.; Barnes Med. Coll., 1902	1920	1920
Davis, Thos. W., Winston-Salem; S. C. Med. Coll., 1898	1899	1900
DeLaney, C. O., Winston-Salem; Jeff. Med. Coll., 1919	1919	1926
Edwards, A. D., Winston-Salem; Univ. of Md., 1903	1904	1905
Fearington, Jos. P., Winston-Salem; Univ. of Md., 1887	1887	1904
Flynt, S. S., Rural Hall; P. and S., Balt., 1889	1890	1907
Gray, Eugene Price, Winston-Salem; Johns Hopkins, 1906	1907	1909
Grimes, W. L., Winston-Salem; Johns Hopkins, 1910	1910	1915
Hanes, F. M., Winston-Salem; Johns Hopkins, 1908	1916	1917
Hege, J. Roy, Winston-Salem; Univ. of Md., 1916	1916	1917
Hurdle, S. W., Winston-Salem; Jeff. Med. Coll., 1914	1914	1916
Izlar, H. L., Winston-Salem; Med. Coll. of the State of S. C., 1915	1916	1916
Johnson, Wingate M., Winston-Salem; Jeff. Med. Coll., 1908	1908	1911
Jones, Beverly N., Winston-Salem; Med. Coll. of Va., 1915	1915	1921
Jones, R. Rives, Winston-Salem; Med. Coll. of Va., 1923	1923	1925
Kapp, Henry H., Winston-Salem; Jeff. Med. Coll., 1901	1901	1904

Keiger, O. R., Winston-Salem; Univ. Coll. of Med., Richmond, 1911	1911	1914
Kerr, Jas. Edwin, Winston-Salem; Univ. of Md., 1897	1898	1898
Lawrence, Chas. S., Winston-Salem; Univ. of Ga., 1908	1908	1911
Linville, Aaron Y., Winston-Salem (Hon.); Univ. of N. Y. 1889	1889	1896
Lockett, Everett A., Winston-Salem; Univ. of Pa., 1902	1904	1904
Long, Vann McKee, Winston-Salem; N. C. Med. Coll., 1906	1906	1911
Mimms, C. W., Winston-Salem; Univ. of Louisville, 1914	1916	1917
Moore, R. A., Winston-Salem; N. C. Med. Coll., 1911	1911	1917
Munt, H. F., Winston-Salem; Va. Med. Coll., 1911	1914	1916
Paddison, John Robt., Kernersville; Univ. of Md., 1902	1902	1913
Perkins, J. R., Winston-Salem; Va. Med. Coll., 1904	1910	1917
Pfohl, Samuel F., Winston-Salem; Univ. of Pa., 1894	1898	1898
Pool, B. B., Winston-Salem; Jeff. Med. Coll., 1923	1923	1925
Raymer, M. B., Winston-Salem; N. C. Med. Coll., 1912	1912	1926
Rousseau, J. P., Winston-Salem; Univ. of Md., 1918	1920	1920
Salmons, L. R., Winston-Salem; N. C. Med. Coll., 1912	1912	1916
Schallert, P. O., Winston-Salem; Univ. of Ill., 1904	1911	1912
Schaub, O. P., Winston-Salem; Balt. Med. Coll., 1898	1898	1898
Simmons, R. R., Winston-Salem; Va. Med. Coll., 1917	1923	1924
Slate, John S., Winston-Salem; Univ. Coll. of Med., Va., 1900	1899	1920
Smith, R. E., Winston-Salem; Univ. of Pa., 1923	1923	1926
Spainhour, Ellis H., Winston-Salem; Balt. Med. Coll., 1898	1898	1898
Speas, D. C., Winston- Salem, R. F. D.; Univ. of Md., 1911	1913	1924
Spencer, Wm. O., Winston-Salem (Hon.); Jeff. Med. Coll., 1891	1891	1894
Spicer, R. W., Winston-Salem; N. C. Med. Coll., 1910; Univ. of Pa., 1911	1910	1916
Sprunt, W. H., Jr., Winston-Salem; Univ. of Pa., 1918	1918	1925
Street, C. A., Winston-Salem; Harvard Med. School, 1918	1918	1925
Strickland, Edward F., Winston-Salem (Hon.); Univ. of New York, 1887	1887	1893
Summers, Chas. L., Baltimore, Md., (Hon.); Univ. and P. and S., Md., 1887	1892	1896
Thompson, Edg. S., Winston-Salem; Univ. of N. Y., 1919	1919	1921
Tuttle, Reuben G., Winston-Salem; N. C. Med. Coll., 1909	1909	1913
Valk, A. deT., Winston-Salem; Johns Hopkins, 1910	1913	1914
Wall, R. L., Winston-Salem; Jeff. Med. Coll., 1912	1912	1914
Whittington, Jas. B., Winston-Salem; N. C. Med. Coll., 1911	1911	1913
Wyatt, Wortham, Winston-Salem; Univ. of Pa., 1913	1913	1916

FRANKLIN COUNTY SOCIETY

President: R. B. Henderson. Franklinton; Univ. of Md., 1884	1884	1904
Secretary: S. P. Burt, Louisburg; P. and S., Balt., 1896	1896	1904
Johnson, B. C., Bunn; Univ. of N. C., 1909	1909	1910
Johnson, Harry H., Louisburg; Coll. of P. and S., Balt., 1915	1919	1919
Malone, James E., Louisburg; Bellevue, 1875		1904
Newell, J. O., Louisburg; P. and S., Balt., 1910	1910	1912

Perry, A. H., Wood; Univ. of Md. and P. and S., Balt., 1924	1924	1925
Perry, H. G., Louisburg; P. and S., Balt., 1915	1915	1916
Timberlake, C. V., Youngsville; Jefferson Med. Coll., 1915	1915	1922
Timberlake, Richard E., Youngsville; Jefferson, 1908	1908	1910
Winston, A. R., Franklinton; Bellevue Med. Coll., 1899	1899	1900
Yarborough, R. F., Louisburg; Geo. Wash. Univ., 1898	1899	1899

GASTON COUNTY SOCIETY

President: W. H. Houser, Cherryville; N. C. Med. Coll., 1900	1900	1904
Secretary: James A. Anderson, Gastonia; Univ. of Ga., 1904	1909	1909
Adams, Charles E., Gastonia; Univ. of Md., 1897	1885	1904
Anders, McT. G., Gastonia; Md. Med. Coll., 1901	1902	1902
Anthony, J. E., Kings Mountain; Univ. of Tenn., 1911	1911	1911
Belk, Geo. W., Gastonia; Atlanta School of Med., 1913	1918	1924
Blair, J. L., Gastonia; Atlanta Med., 1915	1920	1921
Boyles, M. F., Dallas; N. C. Med. Coll., 1917	1917	1920
Campbell, J. W., Gastonia; P. and S., Balt., 1893	1919	1920
Clinton, Roland S., Gastonia; Univ. of Md., 1914	1914	1920
Eddleman, Hall M., Gastonia; Coll. of Phys. and Surgs., Balt., 1886	1889*	1904
Garrison, D. A., Gastonia; Louisville Med. Coll., 1896	1896	1900
Glenn, Henry F., Gastonia; P. and S., Atlanta, 1900	1900	1904
Glenn, Lucius N., Gastonia; Univ. of Md., 1897	1897	1904
Groves, R. B., Lowell; Med. Coll. of Va., 1924	1924	1924
Hood, J. Sidney, Gastonia; Jeff. Med. Coll., 1907	1907	1910
Hord, J. G., Kings Mountain; Univ. Nashville, 1886	1891	1926
Hunter, W. B., Cramerton; Univ. of Pa., 1911	1911	1920
Johnson, R. Lee, Gastonia; Jefferson, 1911	1911	1918
Lyday, C. E., Gastonia; Atlanta S. of Med., 1910	1910	1920
McAdams, C. R., Belmont; N. C. Med. Coll., 1912	1912	1916
McCombs, C. J., Gastonia; N. C. Med. Coll., 1905	1905	1908
Mathews, W. S., Bessemer City; 1910	1910	1926
Miller, Oscar L., Gastonia; Atlanta Coll. of P. and S., 1912	1921	1922
Miller, R. C., Gastonia; N. C. Med. Coll., 1909	1918	1919
Moore, D. B., Mt. Holly; Med. Coll. of Va., 1915	1915	1921
Moore, R. A., Gastonia; Univ. of Pa., 1923	1924	1925
Oates, W. C., Belmont; N. C. Med. Coll., 1919	1921	1924
Patrick, Geo. R., Jr., Bessemer City; Univ. of Md., 1916	1916	1920
Patrick, L. N., Gastonia; Univ. of Md., 1909	1910	1913
Pressly, J. M., Belmont; N. C. Med. Coll., 1915	1915	1920
Pugh, Charles H., Gastonia; N. C. Med. Coll., 1910	1910	1913
Quickel, Thomas C., Gastonia; Tulane Univ., 1900	1899	1904
Reid, James W., Lowell; Jefferson, 1908	1908	1910
Rhyne, Robert Edgar, Gastonia; N. C. Med. Coll., 1907	1907	1908
Stewart, J. J., Mt. Holly; N. C. Med. Coll., 1904	1904	1908
Stokes, P. B., Kings Mountain; Univ. N. C., 1914; Med. Coll. Va., 1917	1917	1926
Swann, Jos. F., Gastonia; P. and S., Balt., 1896	1896	1905
Taylor, E. C., Mount Holly; N. C. Med. Coll., 1910	1911	1923
Wilkins, Samuel A., Dallas; Univ. of Ky., 1902	1903	1903

*Registered.

GATES COUNTY SOCIETY

President: .....
Secretary: .....

GRANVILLE COUNTY SOCIETY

President: Sam H. Cannady, Oxford; Univ. of Va., 1887	1889	1904
Secretary: Joseph A. Morris, Oxford; Vanderbilt Univ., 1890	1893	1899
Bullock, W. B., Oxford; Bellevue Med. Coll., 1892	1892	1893
Daniel, N. C., Oxford; N. C. Med. Coll., 1895	1895	1902
Hardee, Parrott R., Stem; P. and S., Balt., 1885	1885	1906
Hays, B. K., U. S. Veterans Hosp., Fort Lyon, Colo. (Hon.); Univ. Coll. of Med., Va., 1894	1894	1897
Noblin, Roy L., Stovall; Med. Coll. of Va., 1924	1924	1924
Sikes, G. T., Creedmoor (Hon.); Univ. of Md., 1883	1884	1884
Taylor, Wm. L., Oxford; Univ. of Va., Charlottesville, 1900	1901	1901
Thomas, Wm. N., Oxford; Va. Med. Coll., 1911	1911	1914
Thompson, Joseph W., Creedmoor; Univ. of Ky., 1904	1907	1912
Watkins, Geo. S., Oxford; Univ. Coll. of Med., 1900	1900	1908

GREENE COUNTY SOCIETY

President: Wm. W. Whittington, Snow Hill; Louisville Med. Coll., 1895	1895	1902
Secretary: W. E. Dawson, Hookerton; Jefferson, 1920	1920	1922
Edwards, G. C., Hookerton (Hon.); Bellevue Med. Coll., 1883	1883	1883
Harper, J. H., Snow Hill; Jefferson, 1905	1906	1907
Murphy, W. B., Snow Hill; Univ. Coll. of Med., Va., 1903	1903	1905

GUILFORD COUNTY SOCIETY

President: Edward R. Michaux, Greensboro; Univ. of N. Y., 1889	1889	1904
Secretary: B. R. Lyon, Greensboro; Columbia Univ., 1915	1920	1920
Ashworth, W. C., Greensboro; P. and S., Balt., 1892	1892	1904
Austin, J. W., High Point; Jeff. Med. Coll., Phila., 1910	1910	1913
Aydlett, H. T., Greensboro; Univ. of Va., 1894	1895	1907
Banner, A. C., Greensboro; Jeff. Med. Coll., 1920	1920	1922
Banner, Chas. W., Greensboro; Univ. of Md., 1899	1899	1901
Battle, John T. J., Greensboro (Hon.); P. & S., Balt. 1884	1884	1890
Beall, Wm. P., Greensboro (Hon.); Jeff. Med. Coll., 1879	1879	1879
Berry, John, Greensboro; Jeff. Med. Coll., 1908	1908	1920
Best, Benj. W., Greensboro; Coll. of P. and S., Balt. 1884	1884	1920
Bonner, O. B., High Point; Univ. of Md., 1917	1920	1921
Bowman, H. P., Greensboro; Univ. of Tenn., 1894	1894	1905
Boyles, J. H., Greensboro; P. and S., Balt., 1903	1903	1904
Braddy, Wade Hampton, Greensboro; Univ. of N. C., 1909	1909	1913
Brockmann, Harry L., High Point; Univ. of Pa., 1917	1917	1921
Buie, R. M., Greensboro; Jeff. Med. Coll., 1914	1914	1920
Burress, D. A., High Point; Louisville Hosp. Med. Coll., 1908	1922	1924

Burrus, John T., High Point; Univ. of Md., 1900; Grant Univ., 1902	1898	1898
Cater, C. D., Greensboro; Emory Univ., 1920	1923	1924
Coe, Samuel S., High Point; Univ. Coll. of Med., Va., 1911	1912	1913
Cole, Walter F., Greensboro; Johns Hopkins, 1909	1909	1910
Cozart, S. R., Greensboro; Med. Coll. of Va., 1923	1923	1925
Crews, N. H., Greensboro; Jeff. Med. Coll., 1914	1914	1916
Davis, R. B., Greensboro; Med. Coll. of Va., Richmond, 1915	1916	1917
Davis, W. C., Summerfield; Univ. of Md., 1896	1899*	1904
Dees, Ralph Erastus, Greensboro; Univ. of Md., 1906	1908	1909
Dees, Ridgon O., Greensboro; Univ. of Md., 1906	1907	1908
Dick, Julius Vance, Gibsonville; Univ. of N. C., 1907	1907	1908
Dodson, H. H., Greensboro (Hon.); Med. Coll. of Va., 1882	1885	1887
Dyer, John W., High Point; Univ. of Louisville, 1916	1921	1925
Edwards, V. E., Greensboro; Univ. of Md., 1913	1913	1913
Farrar, M. R., Pleasant Garden; Univ. of N. C., 1905	1905	1905
Flagge, Philip W., Jamestown; Wash. Univ., St. Louis, 1902	1905	1919
Fortune, Alex. F., Greensboro; Univ. Coll of Med., Va., 1900	1900	1904
Fox, N. A., Guilford College; Univ. of Pa., 1924	1924	1926
Gaw, Lois B., Greensboro; Woman's Med. Coll., Balt., 1907	1907	1924
Gilmer, Charles S., Greensboro, Rt. 6 (Hon.); Univ. of N. Y., 1891	1891	1894
Gilmore, C. M., Greensboro; Med. Coll. of Va., 1925	1925	1926
Glascock, J. H., Greensboro; Women's Med. Coll. of Balt., 1896	1896	1907
Gove, Anna M., Greensboro (Hon.); Woman's Med. Coll. of the New York Infirmary, 1892	1894	1896
Graham, J. A., Kansas City, Mo.; Chicago Coll. of Med. and Surg., 1915	1921	1923
Grayson, C. S., High Point; Geo. Wash. Univ., 1906	1907	1908
Harden, R. N., Greensboro; Univ. of Pa., 1922	1922	1924
Harrison, Edmund, Greensboro; Univ. Coll. of Med., 1896	1900	1900
Harvey, W. W., Greensboro; Emory Univ., 1920	1922	1923
Herring, R. A., Greensboro; Tulane, 1905	1923	1924
Hiatt, H. B., High Point; Univ. of Md., 1907	1907	1910
Holden, E. C., High Point; Long Island Coll. Hosp., 1911	1920	1924
Holt, D. W., Greensboro; Jeff. Med. Coll., 1918	1918	1920
Holt, Wm. T., McLeansville; Univ. of Tenn., 1890	.....	1896
Hudson, C. C., Greensboro; Univ. Coll. of Med. of Va., 1910	1918	1924
Hyatt, Fred C., Greensboro; Jeff. Med. Coll., Phila., 1907	1907	1912
Jackson, Walter L., High Point; N. C. Med. Coll., 1911	1911	1913
Jarboe, Parron, Greensboro; Georgetown Univ., 1905	1906	1907
Jennings, C. W., Greensboro; Med. Coll. of Va., 1916	1916	1926
Jones, Arthur O., Greensboro; Bellevue, 1890	1890	1904
Jones, Wm. M., Greensboro; Univ. of Md., 1903	1903	1903
Keiger, James A., Greensboro; Univ. of Va., 1916	1916	1919
Knight, Wm. P., Greensboro; Balt. Med. Coll., 1898	1898	1898
Lewis, S. V., Greensboro; Med. Coll. of Va., 1916	1916	1923
Long, John W., Greensboro (Hon.); Vanderbilt Univ., 1883, Univ. Nashville, 1884	1884	1884

*Registered.

McAnally, Wm. J., High Point; Balt. Med. Coll., 1897	1896	1899
McCain, Wm. R., High Point; Univ. of Md., 1897	1898	1898
McManus, W. L., Greensboro; Atlanta School of Med., 1906	1912	1913
Mann, I. Thurman, High Point; Jeff. Med. Coll., 1912	1912	1915
Meadows, W. J., Greensboro; Med. Coll. of Ala., 1894	1899	1904
Miles, May S., Greensboro; Laura Mem. Women's Coll. of Med., Cincinnati, Ohio, 1898	1904	1905
Moore, Charles E., Greensboro; Jeff. Med. Coll., 1907	1907	1910
Moseley, Charles W., Greensboro; Balt. Med. Coll., 1893	1893	1896
Ogburn, H. H., Greensboro; Johns Hopkins Univ., 1913	1913	1914
Parker, H. R., Greensboro; Univ. of Syracuse, 1923	1924	1925
Pate, F. J., Greensboro; Univ. of Md. and P. and S., Balt., 1908	1908	1915
Perry, Robt. E., Greensboro; Univ. of Pa., 1921	1921	1925
Post, J. J., Greensboro; Columbia Univ., 1919	1925	1926
Ravenel, S. F., Greensboro; Johns Hopkins, 1923	1923	1926
Reaves, C. R., Greensboro; Univ. of the South, 1906	1913	1913
Reaves, W. P., Greensboro; Univ. of the South, 1903	1905	1907
Reitzel, Claude E., High Point; P. and S., Atlanta, 1902	1902	1902
Roberson, Charles, Greensboro; Long Island Coll. Hosp., 1897	1897	1901
Schoonover, R. A., Greensboro; Baltimore Med. Coll., 1905	1912	1912
Sharpe, F. A., Greensboro; Univ. of Pa., 1916	1916	1920
Sharpe, O. L., Greensboro; Jeff. Med. Coll., 1922	1924	1925
Shohan, Joseph, Greensboro; Coll. P. and S., Balt., 1901	1914	1924
Shreve, J. R., Brown Summit; N. C. Med. Coll., 1915	1915	1920
Simmons, L. L., Greensboro; Univ. Tenn., 1893; Vanderbilt Univ., 1899	1918	1919
Sisk, C. N., Greensboro; Univ. of Nashville, 1905	1922	1923
Slate, J. W., High Point; Univ. Coll. of Med., Rich., 1900	1899	1925
Smith, Owen, High Point; Jeff. Med. Coll. of Phila., 1904	1905	1917
Spoon, A. O., Greensboro; Univ. of N. C., 1908	1908	1910
Spruill, Jos. L., Jamestown; Univ. of Md., 1895	1895	1907
Stanton, D. A., High Point (Hon.); Vanderbilt Univ., 1887	1887	1891
Starr, H. F., Greensboro; Jeff. Med. Coll., 1916	1916	1917
Tankersley, J. W., Greensboro; Jeff. Med. Coll., 1906	1906	1907
Taylor, F. R., High Point; Univ. of Pa., 1913	1913	1915
Taylor, S. R., Greensboro; Univ. of Pa., 1921	1921	1924
Taylor, Wesley, Greensboro; Ann Arbor, 1899	1925	1926
Thomas, J. G., Greensboro; Med. Coll. of Va., 1915	1915	1920
Thompson, C. D., High Point; Univ. of Tenn., 1901	1901	1904
Turner, J. P., Greensboro; Univ. of Md., 1896	1897	1904
Walker, J. B., Gibsonville; Med. Coll. of Va., 1914	1914	1916
Whitaker, A. C., Julian; Univ. of Tenn., 1903	1903	1908
Wilkerson, C. E., Greensboro; Univ. of Nashville, Tenn., Med. Dept., 1907	1908	1909
Williams, B. B., Greensboro; Univ. of Md., 1883	1887	1893
Williams, John D., Guilford Station; Vanderbilt Univ., 1898	1898	1898
Wilson, Albert R., Greensboro (Hon.); Jefferson Med. Coll., 1882	1882	1882

Wilson, N. C., Greensboro; N. C. Med. Coll., 1914	1914	1914
Wolfe, H. C., Greensboro; Med. Coll. of Va., 1917	1917	1920
Wolff, D. R., Greensboro; Jeff. Med. Coll., 1918	1918	1920
Woodruff, Fred G., High Point; Med. Coll. of Va., 1917	1917	1919
Wyatt, H. L., Greensboro; Med. Coll. of Va., 1916	1924	1925
York, Alexander A., High Point; Chattanooga Med. Coll., 1907	1907	1909

HALIFAX COUNTY SOCIETY

President: O. F. Smith, Scotland Neck; Univ. Coll. of Med. Va., 1899	1899	1904
Secretary: Z. P. Mitchell, Weldon; Med. Coll. of Va., 1920	1920	1921
Beckwith, R. P., Roanoke Rapids; Univ. of Pa., 1911	1913	1916
Fleming, W. L., Enfield; Univ. of N. C., 1910	1910	1916
Jarman, F. G., Roanoke Rapids; Univ. Coll. of Med., Va., 1911	1914	1916
Justis, L. H., Littleton; Med. Coll. of Va., 1916	1920	1920
Lassiter, H. G., Weldon; Jeff. Med. Coll., 1918	1918	1920
Long, T. W. M., Roanoke Rapids; Univ. Coll. of Med. Va., 1908	1909	1900
Martin, J. W., Roanoke Rapids; Med. Coll. of Va., 1916	1919	1920
Nicholson, B. M., Enfield; Va. Univ. Coll. of Med., 1910	1910	1913
Palmer, Horace, Littleton; Atlanta School of Med., 1912	1912	1920
Putney, W. R., Littleton; Univ. Coll. of Med., Richmond, 1912	1919	1920
Suiter, W. G., Weldon; Med. Coll. of Va., 1917	1917	1920
Thigpen, H. G., Scotland Neck; Jeff. Med. Coll., 1917	1917	1920
Weathers, Bahnson, Roanoke Rapids; Wash. Univ. Med. School, St. Louis, 1917	1921	1922
Whitaker, F. C., Enfield; Maryland Med. Coll., 1911	1911	1919

HARNETT COUNTY SOCIETY

President: R. L. Warren, Dunn; Tulane Univ., 1911	1911	1912
Secretary: Jos. W. Halford, Lillington; Geo. Wash. Univ. 1904	1905	1905
Duncan, S. A., Coats; Tulane Univ., 1924	1924	1926
Hicks, Isham Faison, Dunn; N. C. Med. Coll., 1902	1902	1904
Holt, Wm. P., Erwin; Jeff. Med. Coll., 1895	1895	1901
McKay, Joseph F., Buies Creek; S. C. Med. Coll., 1884	1885	1904
McLean, John W., Godwin; N. C. Med. Coll., 1902	1902	1906
Martin, J. F., Dunn; N. C. Med. Coll., 1905	1905	1918
Melvin, Wayman C., Linden; Univ. Coll. of Med., Richmond, 1900	1900	1905
Parker, Paul G., Erwin; Med. Coll. of Va., Richmond, 1916	1916	1917
Phillips, J. W., Lillington; Geo. Washington Univ., 1921	1922	1923
Sexton, C. Hector, Dunn; Univ. of Md., 1890	1890	1904

HAYWOOD COUNTY SOCIETY

President: Samuel L. Stringfield, Waynesville; Jeff. Med. Coll., 1905	1905	1907
Secretary: J. R. McCracken, Waynesville; N. C. Med. Coll., 1902	1902	1903
Abel, J. F., Waynesville; Univ. of Balt., 1892	1893	1899
Allen, Rufus L., Waynesville; Univ. of Md., 1885	1885	1889
Davis, F. M., Canton; Vanderbilt Univ., 1894	1894	1904

Francis, Wm. G., Waynesville; Jeff. Med. Coll., 1915	1916	1925
Johnson, W. C., Canton; Tulane Univ. of La., 1912	1912	1917
Kirkpatrick, W. L., Waynesville; Vanderbilt Univ., 1894	1894	1905
Montgomery, K. E., Miami, Fla.; Univ. of Louisville, 1917	1920	1920
Reynolds, T. F., Canton; N. C. Med. Coll., 1904	1904	1920
Russell, Jesse M., Canton; Univ. of Nashville, 1911	1911	1912
Stringfellow, Jas. L., Waynesville; Univ. of Va., 1915	1921	1922
Stringfield, Thomas, Waynesville; Vanderbilt Univ., 1898	1898	1899
Way, J. Howell, Waynesville (Hon.); Vanderbilt Univ., 1886	1885	1887

HENDERSON COUNTY SOCIETY

President: W. E. Brackett, Hendersonville; Jeff. Med. Coll., 1915	1915	1924
Secretary: R. C. Sample, Hendersonville; Univ. of Pa., 1915	1915	1919
Brown, J. S., Hendersonville (Hon.); Northwestern Univ., 1893	1894	1895
Cliff, B. F., Hendersonville; Geo. Washington Univ., 1908	1909	1915
Dixon, Guy E., Hendersonville; P. and S., St. Louis, 1903	1903	1903
Drafts, Andrew B., Hendersonville; Univ. of Va., 1896	1899	1903
Edgerton, Jas. L., Hendersonville (Hon.); Univ. of Md., 1877	1889*	1890
Greenwood, S. E., Fletcher; Tenn. Med. Coll., 1902	1903	1904
Howe, Wm. B. White, Jr., Hendersonville; Med. Coll. of S. C., 1906	1907	1908
Kirk, W. R., Hendersonville; Central Univ., Louisville, 1891	1901	1903
Mallett, E. P., Hendersonville; L. I. Coll. Hosp., Brooklyn, 1889	1914	1914
Patton, A. B., Hendersonville; Northwestern Univ., 1911	1925	1926
Payne, J. W., E. Flat Rock; Med. Coll. Maryland, 1903	1924	1926
Query, Richard Z., Hendersonville; Univ. Coll. of Med., Richmond, 1907	1907	1908
Russell, Lloyd P., Fletcher; Univ. of Nashville, 1901	1902	1903
Sumner, Thos. W., Fletcher; Jeff. Med. Coll., 1910	1910	1911
Weddington, J. L., Hendersonville; Sou. Med. Coll. Atlanta, 1898	1925	1926

HERTFORD COUNTY SOCIETY

President: W. B. Pollard, Winton; Univ. of Pa., 1899	1903	1905
Secretary: Paul H. Mitchell, Ahoskie; Univ. Coll. of Med., Richmond, 1907	1907	1908
Crisp, S. M., Harrellsville; Univ. of Pa., 1923	1923	1925
Futrell, L. M., Murfreesboro; Va. Med. Coll., 1914	1914	1918
Gary, R. H., Murfreesboro; Coll. of Phys. and Surg., Balt., 1881	1889*	1904
Harrell, Geo. N., Murfreesboro; Univ. Coll. of Med., Richmond, 1907	1907	1909
Mitchell, Jesse H., Ahoskie; Coll. of P. and S., Balt., 1879	1889*	1904
Walker, L. K., Ahoskie; Univ. of Md., 1911	1911	1917

HOKE COUNTY SOCIETY

President: K. B. Geddie, Raeford; Jeff. Med. Coll., 1921	1921	1923
Secretary: L. B. McBrayer, Southern Pines; Louisville Med. Coll., 1889	1891	1900

*Registered.

Bittinger, S. M., Sanatorium; Geo. Washington Univ., 1918 ..... 1924 1924
Brown, G. W., Raeford; Ky. School Med., Louisville, 1898 ..... 1900 1900
Byerly, Wesley Grimes, Sanatorium; Richmond Med., 1924 ..... 1924 1925
Lee, S. E., Sanatorium; Univ. of Md., 1911 ..... 1924 1924
McCain, P. P., Sanatorium; Univ. of Md. and Coll. P. and S., Balt., 1911 ..... 1914 1917
Murray, R. L., Raeford; Univ. of Md., 1923 ..... 1923 1925
Williams, J. H., Sanatorium; Jeff. Med. Coll., 1920 ..... 1920 1922
Yoder, Paul A., Sanatorium; Univ. of Pa., 1923 ..... 1923 1925

HYDE COUNTY SOCIETY

President: ....
Secretary: ....
Harris, Arthur Graham, Fairfield; Univ. of the South, 1905 ..... 1907 1908

IREDELL-ALEXANDER COUNTIES SOCIETY

President: V. K. Hart, Statesville; Univ. of Pa., 1921 ..... 1924 1925
Secretary: J. E. McLaughlin, Statesville (Hon.); Univ. of Md., 1886 ..... 1886 1896
Adams, M. R., Statesville (Hon.); Univ. of Md., 1878 ..... 1884 1884
Anderson, Thos. Eli, Statesville (Hon.); Jeff. Med. Coll., 1878 ..... 1879 1879
Bell, A. E., Mooresville; Univ. of Md. and Coll. of P. and S., 1897 ..... 1897 1904
Crouch, T. D., Stony Point; N. C. Med. Coll., 1909, and Univ. of Md., 1910 ..... 1909 1915
Davis, Jas. W., Statesville; Univ. of Pa., 1913 ..... 1913 1915
Easley, P. S., Statesville; N. C. Med. Coll., 1907; Jeff. Med. Coll., Phila., 1908 ..... 1907 1913
Gilmore, W. D., Ft. Wayne, Ind.; Univ. of N. C., 1903 ..... 1903 1904
Goode, T. V., Statesville; Univ. Coll. of Med., Va., 1912 ..... 1912 1916
Herman, Chas. B., Statesville; Jeff. Med. Coll., 1923 ..... 1923 1925
Hubbard, Fred C., N. Wilkesboro; Jeff. Med. Coll., 1918 ..... 1919 1921
Jurney, Peter Claywell, Turnersburg; Med. Coll. of Va., 1901 1901 1904
Leeper, Donald H., Hiddenite; N. C. Med. Coll., 1906 ..... 1906 1913
Little, E. E., Statesville; N. C. Med. Coll., 1912 ..... 1912 1915
Long, H. F., Statesville (Hon.); Balt. Med. Coll., 1891 ..... 1892 1893
McElwee, Ross S., Statesville; Univ. of Md., 1909 ..... 1909 1910
McLelland, W. D., Mooresville; Jeff. Med. Coll., 1913 ..... 1913 1917
Poston, J. Lewis, Statesville; Jeff. Med. Coll., 1922 ..... 1923 1924
Rhyne, S. A., Statesville; N. C. Med. Coll., 1915 ..... 1915 1920
Sharpe, Frank L., Statesville; Univ. of N. C., 1904 ..... 1904 1905
Sherrill, C. L., Statesville; N. C. Med. Coll., 1914 ..... 1914 1915
Sloan, A. B., Mooresville; Med. Coll. of Va., 1924 ..... 1924 1926
Tally, J. S., Troutman; Univ. of N. C., 1909 ..... 1910 1917
Tatum, Roy C., Statesville; Jeff. Med., 1919 ..... 1919 1920
Thurston, Asa, Taylorsville; Univ. of Md., 1909 ..... 1909 1914
Taylor, G. W., Mooresville; N. C. Med. Coll., 1906 ..... 1906 1917
Trivette, W. A., Hamptonville; Med. Coll. of Va., 1916 ..... 1916 1925
Wilson, W. E., Mooresville; Louisville Med. Coll., 1886 ..... 1886 1920

JACKSON COUNTY SOCIETY

President: Asbury S. Nichols, Sylva; Tenn. Med. Coll., 1906	1907	1913
Secretary: Grover C. Wilkes, Sylva; N. C. Med. Coll., 1916	1916	1920
Candler, Chas. Z., Sylva; P. and S., Atlanta, 1901	1901	1904
Harrington, Carey L., East Laporte; Univ. of Pa., 1922	1924	1924
Hooper, D. D., Sylva; Univ. Coll. of Med., Va., 1905	1905	1905
Nichols, Alvin A., Sylva; Univ. of Nashville Med. Dept., 1898	1904	1904
Van Epp, Owen B., Cashiers; Cleveland-Pulte Med. Coll., 1900	1923	1923

JOHNSTON COUNTY SOCIETY

President: W. J. B. Orr, Smithfield; Univ. of Md., 1920	1920	1922
Secretary: C. C. Massey, Smithfield; Jeff. Med. Coll., 1923	1923	1925
Aycock, F. M., Princeton; Med. Coll. of Va., 1921	1921	1926
Brooks, H. E., Clayton; Med. Coll. of Va., 1917	1917	1923
Coleman, G. S., Kenly; Med. Coll. of Va., 1907	1907	1909
Fitzgerald, J. Herbert, Smithfield; Jeff. Med. Coll., 1920	1920	1922
Grady, Jas. C., Kenly (Hon.); Balt. Univ. School of Med., 1887	1887	1890
Griffin, J. A., Clayton (Hon.); P. and S., Baltimore, 1881	1889*	1890
Hinnant, Milford, Micro; Univ. of Md., 1912	1912	1913
Hocutt, Battle A., Clayton; Univ. of N. C. School of Med., 1906	1906	1908
Hooks, Thel, Smithfield; Med. Coll. of Va., 1901	1901	1903
McLemore, George A., Smithfield; Univ. of N. C., 1906	1906	1908
Mayerberg, I. W., Selma; Jeff. Med. Coll., 1907	1907	1909
Noble, R. J., Selma (Hon.); Ky. Med. School, 1875	1878	1878
Oliver, A. S., Benson; Jeff. Med. Coll., 1914	1914	1919
Parker, G. E., Benson; Coll. of P. and S., Balt., 1886	1889*	1904
Person, J. B., Selma; Med. Coll. of Va., 1897	1897	1900
Rose, A. H., Smithfield; Jeff. Med. Coll., 1906	1906	1907
Stanley, John H., Four Oaks; Univ. of N. C., 1904	1904	1906
Stevens, R. S., Princeton; Univ. of N. C., 1905	1905	1907
Surles, J. B., Four Oaks; Jeff. Med. Coll., 1909	1909	1919
Utley, H. H., Benson; Balt. Med. Coll., 1906	1906	1901
Vick, Geo. D., Selma; Jeff. Med. Coll., 1906	1906	1907
Wharton, L. D., Smithfield (Hon.); Tulane Univ., 1893	1893	1894
Whitted, W. P., Kenly; Univ. of Md., 1919	1919	1921
Wilson, W. G., Smithfield; Jeff. Med. Coll., 1921	1921	1924
Woodard, G. B., Kenly; Med. Coll. of Va., 1915	1915	1916
Young, J. J., Clayton; P. and S., Balt., 1897	1896	1904

JONES COUNTY SOCIETY

President: A. F. Hammond, Pollocksville; Univ. Coll. of Med., Va., 1903	1903	1914
Secretary: B. W. Page, Maysville; Tulane Univ., 1909	1909	1919
Bell, J. C., Maysville; P. and S., Balt., 1910	1915	1922
Bender, E. L., Trenton; Med. Coll. of Va., 1916	1916	1925

LEE COUNTY SOCIETY

President: Floyd L. Knight, Sanford; Univ. of Va., 1924	1925	1926
Secretary: Lynn McIver, Sanford; Kentucky Univ., 1901	1902	1902

*Registered.

Bennett, W. H., Sanford; Loyola Univ., 1918	1920	1922
Foster, J. F., Sanford; N. C. Med. Coll., 1916	1916	1919
Lutterloh, I. H., Sanford; Vanderbilt Univ., 1890	1894*	1922
Lutterloh, I. Hayden, Jr., Sanford; Jeff. Med. Coll., 1921	1921	1922
Mathews, M. L., Sanford; Univ. of N. C., 1903	1903	1904
Monroe, J. P., Sanford; P. and S., Balt., 1901	1901	1905
Scott, Charles L., Sanford; Univ. of Md., 1897	1899	1916
Snipes, E. P., Jonesboro (Hon.); Vanderbilt Univ., 1890	1889*	1890
Sowers, Roy G., Jonesboro; Univ. of Md., 1923	1923	1924
Stockton, W. I., Carthage, R. F. D.; P. and S., Univ. of Md., 1915	1915	1925
Watson, Leon, Broadway; N. C. Med. Coll., 1900	1900	1904

LENOIR COUNTY SOCIETY

President: Vance P. Peery, Kinston; Med. Coll. of Va., 1916	1917	1917
Secretary: Paul F. Whitaker, Kinston; Med. Coll. of Va., 1922	1922	1924
Adams, L. C., LaGrange; N. C. Med. Coll., 1903	1903	1921
Dixon, Wm. H., Kinston; Med. Coll. of Va., 1901	1901	1901
Hardy, Ira M., Kinston; Med. Coll. of Va., 1901	1902	1902
Hyatt, A. L., Kinston; Univ. of Md., 1910	1910	1921
McGeachy, R. S., Kinston (Hon.); Bellevue Hosp., 1894	1894	1895
Mangum, C. P., Kinston; Jeff. Med. Coll., 1918	1918	1920
Moseley, Z. V., Kinston; Va. Univ. Coll. of Med., 1913	1913	1914
Parrott, Albert DeK., Kinston; Univ. Coll. of Med., Va., 1906	1906	1908
Parrott, James M., Kinston (Hon.); Tulane Univ., 1895	1895	1896
Parrott, M. C., Kinston; Tulane Univ., 1917	1917	1919
Parrott, Wm. T., Kinston; Tulane Univ., 1899	1899	1901
Sabiston, Frank, Kinston; Univ. of Md., 1918	1919	1926
West, B. C., Kinston; Univ. of Pa., 1924	1924	1926
West, C. F., Kinston; Univ. of Pa., 1917	1917	1920
Weyher, V, E., Kinston; Univ. Vienna, Austria, 1869	1889*	1919
Whitaker, Frederick A., Kinston; Univ. of Pa., 1875	1889*	1884
Whitaker, Frederick S., Kinston; Balt. Med. Coll., 1913	1913	1914
Wooten, Floyd P., Kinston; Jeff. Med., 1920	1920	1923

LINCOLN COUNTY SOCIETY

President: J. F. Gamble, Lincolnton; Univ. of Tenn., 1903	1915	1919
Secretary:		
Bradford, B. M., Lincolnton; N. C. Med. Coll., 1915	1913	1923
Crowell, L. A., Lincolnton; Balt. Med. Coll., 1892	1892	1898
Edwards, F. D., Toluca; Atlanta Med., 1914	1916	1919
Elliott, W. F., Lincolnton; Pa. Medico-Chir. Coll., 1916	1916	1917
Gamble, J. R., Lincolnton; Univ. of Tennessee, 1911	1911	1912
Hoover, C. H., Crouse; Chattanooga Med. Coll., 1900; Balt. Med. Coll., 1903	1903	1903
Jacocks, W. P., New York City; Univ. of Pa., 1911	1911	1913

*Registered.

Kiser, W. C., Lincolnton; Southern Med. Coll. of Ga., 1889	1893*	1904
Lee, R. E., Lincolnton; Univ. of Md., 1896	1896	1918
Shellum, O. W., Denver; N. C. Med. Coll., 1909	1909	1913

McDOWELL COUNTY SOCIETY

President: J. F. Miller, Marion; Med. Chi. Phila., 1906	1915	1919
Secretary: B. B. Ashworth, Marion; P. and S., Balt., 1892	1893	1900
Butt, R. B., Marion; Emory Univ., Atlanta, 1920	1920	1921
Johnson, John B., Old Fort; Univ. Louisville Med. Dept., 1905	1914	1914
Jonas, John F., Marion; Balt. Med. Coll., 1903	1903	1903
Kirby, Guy S., Marion; Univ. Coll. of Med., Va., 1897	1896	1903
McIntosh, D. M., Old Fort; Med. Coll. of Va., 1904	1907	1909

MACON-CLAY COUNTIES SOCIETY

President: S. H. Lyle, Franklin; Univ. of Nashville, 1883	1881	1882
Secretary: W. A. Rogers, Franklin; Univ. of Nashville, 1898	1898	1898
Angel, F., Franklin; Jeff. Med. Coll., 1918	1923	1924
Fouts, J. H., Franklin; Vanderbilt Univ., 1895	1895	1918
Horsley, H. T., Franklin; Balt. Med Coll., 1907	1915	1918
Killian, P. B., Hayesville; Atlanta Coll. of P. and S., 1900	1909	1909
Lapham, Mary E., Highlands; Woman's Med. Coll. of Pa., 1900	1906	1906
Williams, N. G., Franklin; Emory University, 1917	1924	1926

MADISON COUNTY SOCIETY

President: Frank Roberts, Marshall; Jeff. Med. Coll., 1892	1892	1902
Secretary: Jos. N. Moore, Marshall; Univ. of N. C., 1905	1905	1909
Baird, John W., Mars Hill; Tenn. Med. Coll., 1901	1908	1809
Burnett, Isaac E., Mars Hill; Tenn. Med. Coll., 1901	1905	1904
English, I. L., Faust	1898*	1904
Locke, Eva M., White Rock; Univ. of Mich., 1900	1921	1922
Packard, G. H., Meredith, N. H., Rt. 1; P. and S., Balt., 1898	1914	1915
Peck, Edward J., Hot Springs; Vanderbilt Univ., 1879; Univ. of Nashville, 1880	1893*	1903
Robinson, Willard F., Mars Hill; Vanderbilt Univ., 1896	1903	1904
Sams, W. A., Marshall; Lincoln Mem., 1911	1919	1920
Tilson, Jacob Carson, Marshall; Lincoln Mem. Univ., 1892	1885	1904

MARTIN COUNTY SOCIETY

President: Edgar M. Long, Hamilton; Univ. of Md., 1909	1909	1910
Secretary: Wm. E. Warren, Williamston, Nongrad., Univ. N. Y.	1893	1894
Nelson, Robert, J., Robersonville (Hon.); Louisville Med. Coll., 1890	1890	1893
Pittman, E. E., Oak City; Med. Coll. of Va., 1919	1919	1920
Rhodes, James S., Williamston; Med. Coll. of Va., 1906	1906	1907
Saunders, Jos. H., Williamston; Univ. Coll. of Med., Va., 1905	1905	1909
Smithwick, James E., Jamesville; Univ. Coll. of Med., 1897	1897	1904

*Registered.

Ward, Jesse E., Robersonville; Univ. of Md., 1904	1904	1905
Ward, Vernon Albert, Robersonville; Jeff. Med. Coll., 1908	1908	1914
York, Hugh B., Williamston; P. and S., Balt., 1906	1906	1907

MECKLENBURG COUNTY SOCIETY

President: Robt. F. Leinbach, Charlotte; Univ. of Pa., 1907	1907	1910
Secretary: John P. Kennedy, Charlotte; Jeff. Med. Coll., 1915	1915	1920
Abernathy, H. N., Charlotte; Louisville Med. Coll., 1894	1894	1899
Alexander, Annie L., Charlotte (Hon.); Women's Med. Coll., Pa., 1884	1885	1885
Alexander, James R., Charlotte; Univ. of Md., 1894	1894	1899
Alexander, M. Janet, Montgomery, India; Women's Med. Coll., Pa., 1917	1917	1918
Allan, William, Charlotte; P. and S., Balt., 1906	1906	1914
Ashe, J. R., Charlotte; Columbia Univ., 1911	1915	1915
Austin, D. R., Charlotte; Jeff. Med. Coll., 1917	1917	1918
Austin, Frederick De Costa, Charlotte; N. C. Med. Coll., 1907	1907	1908
Barret, H. P., Charlotte; Univ. of Louisville, 1908	1917	1919
Barron, A. A., Charlotte; Vanderbilt Univ., 1909	1910	1910
Biggart, William P., Charlotte; Med. Coll. of State of S. C., 1925	1925	1926
Black, Geo. Wm., Pineville; Med. Coll. of Va., 1924	1924	1925
Blair, Andrew, Charlotte; Univ. of Pa., 1924	1925	1926
Blalock, B. K., Charlotte; Univ. of Md., 1913	1913	1917
Bost, T. C., Charlotte; Geo. Washington Univ., 1915	1920	1921
Boyette, E. C., Charlotte; Balt. Med. Coll., 1893	1898	1906
Brenizer, A. G., Jr., Charlotte; Johns Hopkins, 1908, and Univ. of Heidelberg	1911	1911
Britt, C. S., Charlotte; Emory Univ., 1920	1925	1926
Caldwell, J. H., Charlotte; N. C. Med. Coll., 1914	1914	1914
Collins, George, Raleigh; Jeff. Med. Coll., 1920	1921	1922
Craven, Thomas, Huntersville; Jeff. Med. Coll., 1917	1917	1918
Craven, W. W., Charlotte; Univ. of Md., 1903	1904	1904
Crowell, Andrew J., Charlotte (Hon.); Univ. of Md., 1893	1892	1894
Crowell, L. A., Lincolnton; Balt. Med. Coll., 1892	1892	1898
Davidson, John E. S., Charlotte; Univ. of Md., 1894	1898	1898
De Armon, J. McC., Charlotte (Hon.); Univ. of Md., 1886	1886	1887
Donnelly, J., Charlotte; N. C. Univ., 1905	1905	1918
Elliott, J. A., Charlotte; Univ. of Mich., 1914	1919	1920
Faison, I. W., Charlotte (Hon.); Bellevue Med. Coll., 1878	1878	1878
Faison, Yates W., Charlotte; Harvard Univ., 1910	1910	1912
Ferguson, R. T., Charlotte; Va. Univ. Coll. of Med., 1906	1909	1909
Fetner, L. M., Charlotte; N. C. Med. Coll., 1914	1914	1915
Gage, L. G., Charlotte; Univ. of Va., 1915	1921	1922
Gallant, Robert M., Charlotte; N. C. Med. Coll., 1915	1915	1916
Gaul, John Stuart, Charlotte; Medico-Chir., Phila., 1913	1922	1923
Gibbon, James, Charlotte; Jeff. Med. Coll., 1918	1920	1921
Gibbon, Robert L., Charlotte (Hon.); Jeff. Med. Coll., 1887	1887	1888

Graham, Wm. A., Charlotte (Hon.); Columbia Univ., P. and S., N. Y., 1888	1889	1890
Hand, Edgar H., Charlotte; N. C. Med. Coll., Charlotte, 1907	1907	1913
Henderson, S. McD., Charlotte; Univ. of Md., 1894	1894	1904
Hipp, Edw. R., Charlotte; Univ. of Va., 1918	1920	1921
Holton, Thos. J., Charlotte; Emory Univ., 1909	1925	1926
Houser, O. J., Charlotte; N. C. Med. Coll., 1914	1914	1916
Hovis, L. W., Charlotte; N. C. Med. Coll., 1904	1904	1906
Hunter, L. W., Charlotte, Rt. 1 (Hon.); Bellevue Hosp., 1875	1880	1880
Hunter, M. C., Huntersville; Coll. of P. and S., Balt., 1882	1882	1882
Hunter, Myers, Charlotte; Georgetown Univ., 1905	1906	1908
Irwin, Hamner C., Pocatella, Idaho; Univ. of Md., 1905	1908	1916
Irwin, J. R., Charlotte (Hon.); Univ. of Md., 1879	1882	1882
Johnston, J. G., Charlotte; Med. Dept., Vanderbilt Univ., 1899	1913	1916
Justice, Z. K., Davidson; N. C. Med. Coll., 1903	1917	1919
King, Parks M., Charlotte; Bellevue Med. Coll., 1902	1902	1904
Lafferty, Robert H., Charlotte; N. C. Med. Coll., 1906	1906	1908
Lubchenko, N. E., Harrisburg; N. C. Med. Coll., 1915	1915	1916
MacConnell, John W., Davidson; Univ. of Md., 1907	1908	1909
McKay, Hamilton W., Charlotte; N. C. Med. Coll., 1909; Jeff. Med. Coll., 1910	1911	1913
McLaughlin, Calvin S., Charlotte; Univ. of Md., 1896	1896	1903
McManus, H. F., Matthews; Atlanta School of Med., 1913	1922	1923
McPhail, L. D., Charlotte; Univ. of Md., 1900	1900	1902
McPhaul, W. A., Charlotte; Univ. of Nashville, 1904	1905	1907
Martin, Wm. F., Charlotte; Univ. of Md., 1920	1920	1923
Martin, W. J., Davidson; Univ. of Va., 1890	1891	1919
Matheson, James P., Charlotte; Univ. of Md., 1905	1902	1907
Mathews, Vann M., Charlotte; Univ. of Pa., 1918	1918	1921
Mills, C. H. C., Charlotte; Univ. of Md., 1897	1900	1919
Miller, Oscar L., Gastonia; Atlanta Coll. P. and S., 1912	1921	1922
Misenheimer, Charles A., Charlotte (Hon.); N. Y. Univ. Med. Coll., 1882	1882	1882
Montgomery, John C., Charlotte (Hon.); N. Y. Univ. Med. Coll., 1891	1891	1895
Moore, Alexander W., Charlotte; Univ. of Va., 1901; Univ. and Bellevue Hosp. Med. Coll., 1902	1912	1913
Moore, Oren, Charlotte; N. C. Med. Coll., 1911	1911	1912
Munroe, H. Stokes, Charlotte; N. C. Med. Coll., 1902; Jeff. Med., 1903	1902	1904
Munroe, J. P., Charlotte (Hon.); Univ. of Va., 1885	1886	1890
Myers, Alonzo, Charlotte; N. C. Med. Coll., 1911; Bellevue Hosp. Med. Coll., 1916	1911	1920
Myers, John Q., Charlotte; N. C. Med. Coll., 1904	1904	1904
Nalle, B. C., Charlotte; Univ. of Va., 1903	1905	1905
Nance, C. L., Charlotte; N. C. Med. Coll., 1919	1921	1922
Newell, Leone B., Charlotte; Univ. of N. C., 1905	1905	1908
Newton, Howard L., Charlotte; Northwestern Univ., 1921	1923	1924
Nisbet, D. Heath, Charlotte; Harvard Med. Dept., 1917	1917	1920

Nisbet, Walter O., Charlotte; Med. Coll. of S. C., 1889	1889	1889
Northington, J. M., Charlotte; Med. Coll. of Va., 1905	1909	1909
Patterson, Reid, Charlotte; N. C. Med. Coll., 1912	1912	1913
Peeler, Clarence N., Charlotte; N. C. Med. Coll., 1906	1906	1908
Petrie, Robert Wm., Charlotte; Univ. of Md., 1903	1903	1903
Petteway, George H., Charlotte; N. C. Med. Coll., 1913	1913	1914
Phillips, C. C., Charlotte; N. C. Med. Coll., 1912	1912	1917
Pressly, Geo. W., Charlotte (Hon.); Jeff. Med. Coll., 1892	1895	1896
Rankin, Watson S., Charlotte; Univ. of Md., 1901	1901	1901
Ranson, J. Lester, Charlotte; N. C. Med. Coll., 1911	1911	1912
Ray, F. L., Charlotte; Univ. of Va., 1919	1919	1922
Reid, Thomas N., Matthews; N. Y. Univ. Med. Coll., 1891	1891	1904
Ross, Otho B., Charlotte; Univ. Pa., 1909	1909	1912
Scanlon, W. G., Charlotte; Vanderbilt Univ., 1923	1924	1925
Scruggs, W. Marvin, Charlotte; Univ. of Pa., 1914	1914	1920
Shirley, H. C., Charlotte; Johns Hopkins, 1918	1921	1922
Shull, J. Rush, Charlotte; Univ. of Pa., 1910	1910	1913
Sloan, H. L., Charlotte; Univ. of Pa., 1911	1913	1914
Sparrow, Thos. De L., Charlotte; Univ. of Pa., 1920	1920	1923
Squires, Claude B., Charlotte; Jeff. Med. Coll., 1919	1919	1921
Strong, Charles M., Charlotte; Univ. of Md., 1889	1889	1898
Strong, Wm. M., Charlotte; N. C. Med. Coll., 1904	1904	1905
Sullivan, Claude H., Charlotte; Emory Univ., 1917	1924	1925
Taylor, H. C., Charlotte, Chadwick Sta.; Tenn. Med., 1886	1910*	1915
Thompson, S. R., Charlotte; N. C. Med. Coll., 1914	1914	1915
Todd, L. C., Charlotte; Univ. of Mich., 1918	1920	1920
Townsend, M. L., Raleigh; Indiana Med. Coll., 1906	1912	1913
Tucker, John H., Charlotte; Univ. of Va., 1899	1901	1911
Tydeman, F. W. L., Wood River, Ill.; N. C. Med. Coll., 1912	1912	1918
Wakefield, Harry A., Charlotte; N. C. Med. Coll., 1908	1908	1911
Walker, L. D., Charlotte; Med. Coll. of Va., 1908	1917	1919
Wannamaker, Edward J., Jr., Charlotte; Wofford, 1917; Univ. of Pa., 1921	1924	1924
Whisnant, Albert M., Charlotte; P. and S., Balt., 1893	1893	1899
White, Thomas P., Charlotte; Univ. of Pa., 1922	1924	1925
Whitley, Ayer, Matthews; Balt. Med. Coll., 1908	1908	1919
Wingate, G. C., Charlotte; N. C. Med. Coll., 1914	1915	1919
Wishart, Wm. E., Charlotte; N. C. Med. Coll., 1911	1911	1911
Witherspoon, B. J., Charlotte; S. C. Med. Coll., 1894	1900	1911
Woodruff, Julian S., Charlotte; Univ. of Md., 1920	1920	1923

MITCHELL-WATAUGA COUNTIES SOCIETY

President:		
Secretary:		
Bingham, G. D., Sugar Grove; Univ. of Tenn., 1905; Lincoln Mem. Univ., 1908	1909	1920
Butt, Virgil R., Bakersville; Jeff. Med. Coll., 1886	1889*	1907
Gouge, A. E., Bakersville; Med. Coll. of Va., 1917	1917	1920

*Registered.

Hodges, J. M., Boone; Balt. Med. Coll., 1904	1906	1914
Lambert, C. F., Spruce Pine; Jeff. Med. Coll., 1921	1921	1923
Perry, H. B., Valle Crucis; N. C. Med. Coll., 1905	1905	1922
Peterson, C. A., Spruce Pine; N. C. Med. Coll., 1907	1907	1908
Peterson, J. M., Spruce Pine; Tenn. Med. Coll., 1902	1918	1921

MONTGOMERY COUNTY SOCIETY

President: N. G. Nicholson, Jr., Mt Gilead; N. C. Med. Coll., 1917	1917	1920
Secretary: Charles Daligny, Troy (Hon.); Univ. of Paris, 1878	1889*	1891
Boyles, A. C., Troy; Univ. of Md., 1887; Balt. Univ. School Med., 1898	1889*	1912
Dameron, Ernest L., Star; N. C. Med. Coll., 1911	1911	1913
Ingram, Charles B., Mt. Gilead (Hon.); Jeff. Med. Coll., 1886	1886	1892
McMillan, J. M., Candor; P. and S., Atlanta, 1909	1909	1911
Rankin, Pressly R., Mt. Gilead; N. C. Med. Coll., 1910	1910	1912
Shamburger, John B., Star (Hon.); Univ. of Md., 1890	1890	1892
Thompson, Alexander Frank, Troy; Med. Coll. of Indiana, 1895	1895	1904

MOORE COUNTY SOCIETY

President: Augustus A. McDonald, Jackson Springs; N. C. Med. Coll., 1905	1907	1912
Secretary: Waylon Blue, Jackson Springs; Med. Coll. of Va., 1925	1925	1926
Achorn, John W., Pinebluff; Bowdoin Med. School, 1887; Bellevue Med. Coll., 1889	1899	1899
Blair, A. McNiel, Southern Pines; Niagara Univ., 1897	1904	1906
Blue, A. McN., Carthage; Tulane Univ. 1915	1916	1917
Bowman, H. E., Aberdeen; N. C. Med. Coll., 1904	1904	1919
Davis, J. Franklin, High Falls; Med Coll. of Va., 1912	1912	1914
Dickie, J. W., Southern Pines; Jeff. Med. Coll., 1918	1920	1921
Frink, H. W., Southern Pines; Cornell, 1905	1925	1926
Grier, Charles T., Carthage; N. C. Med. Coll., 1910	1912	1913
Harper, W. T., Southern Pines; Jeff. Med. Coll., 1920	1920	1923
Holt, Erastus E., Southern Pines; Med. School of Maine, 1874; Columbia Univ. Coll. of P. and S., 1875	1921	1922
McDuffiie, W. N., Hemp; Emory Univ. Sch. of Med., Atlanta, 1916	1920	1921
McLeod, A. H., Aberdeen; Balt. Med. Coll., 1896	1896	1904
Marr, M. W., Pinehurst; Tufts Coll. Med. School, Boston, 1907	1909	1915
Milliken, J. S., Southern Pines; Jeff. Med. Coll., 1915	1915	1916
Mudgett, W. C., Southern Pines; Maryland Med. Coll., 1903	1908	1911
O'Briant, A. L., Cameron; Jeff. Med. Coll., 1920	1920	1922
Rosser, R. G., Vass; N. C. Med. Coll., 1909	1909	1917
Shields, Henry B., Carthage; Atlanta Med. Coll., 1882	1887	1904
Street, M. E., Glendon; P. and S., Balt., 1893	1893	1902

*Registered.

NASH COUNTY SOCIETY

President: John L. Lane, Rocky Mount; N. C. Med. Coll., 1906	1906	1914
Secretary: Adam T. Thorp, Rocky Mount; Univ. of Pa., 1921	1921	1923
Battle, Ivan Proctor, Rocky Mount; Jefferson Med., 1904	1905	1914
Boice, E. S., Rocky Mount; Univ. of Pa., 1909	1914	1915
Brantley, Hassell, Spring Hope; Jeff. Med. Coll., 1888	1888	1901
Brantley, J. C., Spring Hope; Jeff. Med. Coll., 1916	1916	1922
Coppedge, T. O., Nashville; P. and S., Balt., 1908	1909	1917
Cutchin, J. Henry, Whitakers; Univ. Coll. of Med., Rich., 1911	1911	1915
Daughtridge, A. L., Rocky Mount; Univ. of Md., 1924	1924	1924
Deans, A. W., Battleboro; Med. Coll. of Va., 1915	1915	1917
Denton, A. L., Castalia; Med. Coll. of Va., 1918	1921	1923
Dixon, W. H., Rocky Mount; Jefferson Med. Coll., 1919	1919	1922
Fleming, M. I., Rocky Mount; Jeff. Med. Coll., 1904	1906	1919
Hines, E. R., Rocky Mount; Med. Coll. of S. C., 1916	1916	1917
Kinlaw, Wm. Bernard, Rocky Mount; Univ. of Pa., 1920	1920	1923
Knowles, D. L., Rocky Mount; Univ. of Pa., 1918	1918	1920
Kornegay, Lemuel W., Rocky Mount; N. C. Med. Coll., 1906	1906	1914
Large, H. Lee, Rocky Mount; Med. Coll. of Va., 1917	1918	1918
Looney, J. J. W., Rocky Mount; Univ. of Va., 1909	1919	1919
Lyon, Henry Wise, Rocky Mount; Univ. of Pa. Sch. of Med. 1918	1919	1920
Martin, J. H., Red Oak; Univ. of Nashville, 1903	1904	1916
Noell, R. H., Rocky Mount; Univ. of Md., 1916	1916	1920
Perry, E. M., Rocky Mount; P. and S., Balt., 1907	1907	1920
Quillen, Emile B., Rocky Mount; Univ. of Md., 1904	1906	1914
Smith, C. T., Rocky Mount; Univ. of Pa., 1918	1918	1920
Speight, J. A., Rocky Mount; Univ. of La., 1914	1915	1916
Speight, J. P., Rocky Mount; Jeff. Med. Coll., 1906	1906	1917
Staley, S. Walter, Rocky Mount; Med. Coll. of S. C., 1901	1901	1914
Vann, J. R., Jr., Spring Hope; Jeff. Med. Coll., 1917	1917	1919
Whitehead, J. P., Rocky Mount; Univ. of Md., 1899	1899	1914
Willis, B. C., Rocky Mount; Med. Coll., of Va., 1909	1916	1916
Winstead, J. A., Nashville; N. C. Med. Coll., 1914	1916	1916

NEW HANOVER COUNTY SOCIETY

President: J. B. Sidbury, Wilmington; Columbia Univ., N. Y., 1912	1915	1916
Secretary: D. R. Murchison, Wilmington; Johns Hopkins, 1916	1922	1923
Bellamy, Robert H., Wilmington; Jeff. Med. Coll., 1902	1902	1902
Bowdoin, George W., Wilmington; Med. Coll. of Va., 1914	1914	1916
Broadway, R. E., Southport; Med. Coll. of S. C., 1911	1923	1926
Bullock, Ernest S., Wilmington; Univ. of Md., 1911	1911	1911
Codington, H. A., Wilmington; Univ. of Md., 1911	1915	1917
Cranmer, J. B., Wilmington; Univ. of N. C., 1905	1905	1907
Crouch, A. McR., Wilmington; Jeff. Med. Coll., 1916	1916	1918
Elliott, A. H., Wilmington; Jeff. Med. Coll., 1919	1919	1921
Evans, J. E., Wilmington; Univ. of Md., 1916	1921	1916
Farthing, L. E., Wilmington; Univ. of N. C., 1906	1906	1913

Freeman, J. D., Wilmington; Med. Coll. of Va., 1918	1921	1922
Galloway, Walter Curtis, Wilmington (Hon.); Washington Univ., 1874	1880	1880
Graham, Benj. R., Wilmington; Univ. of Va., 1895	1895	1916
Green, Thomas M., Wilmington; Univ. of Md., 1901	1901	1904
Hall, James S., Wilmington; Univ. of S. Calif., 1900	1921	1924
Hamilton, John H., Wilmington; Med. Sch. of Harvard, 1916	1926	1926
Harriss, Andrew H., Wilmington (Hon.); Medico-Chirurgical Coll., Phila., 1893	1892	1894
Hoggard, J. T., Wilmington; Univ. Med. Coll., Rich., 1906	1906	1922
Honnet, Joseph H., Wilmington; Columbia Univ., 1900	1901	1904
Hooper, Joseph W., Wilmington; Univ. of Md., 1909	1912	1919
Jewett, Robert D., Wilmington (Hon.); Univ. of Va., 1888	1890	1890
Johnson, Geo. W., Wilmington; Univ. of Pa., 1920	1920	1921
Koonce, S. Everett, Wilmington; P. and S., of Balt., 1896	1896	1900
McMillan, W. D., Wilmington (Hon.); Univ. of Md., 1869	1889*	1892
Mebane, W. C., Wilmington; N. C. Med. Coll., 1905	1905	1916
Moore, Julian A., Wilmington; Univ. of Pa., 1918	1918	1921
Moore, W. Houston, Wilmington; Jeff. Med. Coll., 1910	1910	1911
Murphy, John G., Wilmington; Univ. of Louisville, 1903	1903	1905
Nesbitt, Charles T., Wilmington; Baltimore Med. Coll., 1893	1907	1908
Peterson, W. C., Wilmington; Univ. of Va., 1917	1920	1921
Robertson, James F., Wilmington; Univ. of Pa., 1913	1913	1916
Schonwald, John T., Wilmington (Hon.); Long Island Coll. Hosp., 1879	1880	1881
Sloan, D. B., Wilmington; Univ. of Pa., 1914	1914	1920
Slocum, R. B., Wilmington; Johns Hopkins, 1905	1907	1907
Smith, Slade A., Wilmington; N. C. Med. Coll., 1907	1907	1921
Watson, Thomas M., Wilmington; Tulane Univ., 1919	1919	1920
Wessel, John C., Wilmington; Univ. of Md., 1900	1900	1900
Wood, E. J., Wilmington; Univ. of Pa., 1902	1903	1903

NORTHAMPTON COUNTY SOCIETY

President: Clifton G. Parker, Woodland; Univ. Coll. of Med. of Va., 1907	1907	1913
Secretary: W. E. Futrell, Lasker; Jeff. Med. Coll., 1921	1921	1923
Boone, S. B., Jackson; Univ. Coll. of Med., Va., 1911	1911	1921
Fleetwood, Jos. A., Conway; Tulane, 1921	1921	1923
Hodge, A. R., Severn; Med. Coll. of Va., 1925	1925	1926
Lewis, H. W., Jackson (Hon.); Univ. of N. Y., 1877	1889*	1887
Lister, J. L., Jackson; Med. Coll. of Va., 1896	1896	1909
McDaniel, L. E., Lasker; Univ. of Md., 1911	1915	1916
Parker, C. P., Seaboard; Univ. Coll. of Med., Va., 1915	1915	1916
Parker, Walter R., Woodland; Med. Coll. of Va., 1916	1916	1919
Vaughan, J. C., Rich Square; Med. Coll. of Va., 1915	1915	1916

ONSLOW COUNTY SOCIETY

President: John P. Henderson, Jacksonville; Va. Med. Coll., 1918	1919	1921

*Registered.

Secretary:		
Bryan, Lorenzo D., Sneads Ferry; Tulane, 1910	1910	1911
Cox, E. L., Jacksonville (Hon.); Univ. of Md., 1889	1889	1892
Sutton, Carl W., Richlands; Tulane Med. Coll., 1905	1905	1907
Thompson, Cyrus, Jacksonville; Tulane Univ., 1878	1889*	1905

PAMLICO COUNTY SOCIETY

President: D. A. Dees, Bayboro; Balt. Med. Coll., 1903	1903	1905
Secretary: J. J. Purdy, Oriental; Med. Coll. of Va., 1900	1914	1915
Daniels, O. C., Oriental; Med. Coll. of Va., 1903	1903	1916
McCotter, St. Elmo, Bayboro; P. and S., Atlanta, 1908	1908	1909
Woodard, E. D., Bayboro; Loyola Univ., 1919	1920	1921

PASQUOTANK-CAMDEN-DARE COUNTIES SOCIETY

President		
Secretary		
Barkwell, J. H., Weeksville; Atlanta School of Med., 1908	1924	1925
Bulla, M. S., Elizabeth City; Miami Med. Coll., Cin., O., 1905	1921	1921
Combs, Howard J., Elizabeth City; Jeff. Med. Coll., 1918	1918	1919
Fearing, Isaiah, Elizabeth City; P. and S., Balt., 1896	1896	1904
Fearing, Zenas, Jr., Elizabeth City; Univ. Coll. of Med., 1901	1901	1904
Griggs, John B., Elizabeth City; Univ. of Md., 1892	1892	1904
Hoggard, Wm. Alden, Hertford, Rt. 3; Univ. Coll. Med., Va., 1907; Vanderbilt Univ., 1914	1907	1910
Hoyle, Hughes B., Manteo; N. C. Med. Coll., 1896	1896	1904
Johnston, W. W., Manteo; N. C. Med. Coll., 1913	1913	1920
Kendrick, R. L., Elizabeth City; Univ. of Va., 1913	1913	1915
Lister, E. W., Weeksville; Med. Coll. of Va., 1896	1896	1916
Newby, G. E., Hertford; Jeff. Med. Coll., 1900	1901	1916
Peters, W. A., Elizabeth City; Med. Coll. of Va., 1915	1915	1916
Saliba, John, Elizabeth City; Univ. of Edinburgh, Scotland, 1893	1914	1914
Sawyer, W. W., Elizabeth City; Univ. of Md., 1903	1903	1904
Stephens, W. L., Shiloh; Univ. Coll. of Va., 1912	1912	1914
Walker, H. D., Elizabeth City; Univ. of Md., 1902	1902	1902
Ward, I. A., Elizabeth City; Univ. of N. C., 1907	1907	1915
Williams, Claude B., Elizabeth City; Univ. Coll. of Med., Richmond, 1903	1903	1907

PENDER COUNTY SOCIETY

President:		
Secretary:		
Taylor, W. I., Burgaw; N. C. Med. Coll., 1902	1904	1905

PERSON COUNTY SOCIETY

President: Bedford E. Love, Roxboro; Univ. of Md., 1904	1904	1905
Secretary: Austin F. Nichols, Roxboro; Univ. of N. C., 1908	1908	1909
Beam, H. M., Roxboro; Columbia Univ., 1918	1918	1919
Gentry, Geo. W., Roxboro; Univ. of N. C., 1910	1910	1911
Long, Walter T., Roxboro; Balt. Med. Coll., 1905	1905	1907
Merritt, John H., Woodsdale, Rt. 1; Univ. of N. C., 1906	1907	1908

*Registered.

Thaxton, B. A., Roxboro; Jeff. Med. Coll., 1914	1914	1916

PITT COUNTY SOCIETY

President: Louis C. Skinner, Greenville; Univ. of Md., 1901	1901	1903
Secretary:	------	------
Basnight, Thos. G., Stokes; Univ. of Md., 1904	1905	1907
Beasley, E. B., Fountain; Univ. of Pa. School of Med., 1911	1911	1915
Cox, B. T., Winterville; Univ. of Md., 1888	1888	1890
Dawson, Walter W., Grifton; Univ. of Md., 1897	1897	1900
Dickinson, Elijah T., Greenville; Med. Coll. of Va., 1895	1895	1900
Dixon, G. G., Ayden; Med. Coll. of Va., 1915	1915	1917
Dixon, Joseph, Greenville; Med. Coll. of Va., 1894	1893	1895
Ellen, C. J., Greenville; Univ. Coll. of Med., Rich., 1911	1911	1919
Frizzelle, M. T., Ayden; Univ. Coll. of Med., Richmond, 1907	1907	1909
Garrenton, Cecil, Bethel; Med. Coll. of Va., 1908	1908	1915
Hemmingway, J. D., Bethel; N. C. Med. Coll., 1915	1917	1917
Hooker, J. S., Farmville; Emory Univ., 1923	1923	1924
Laughinghouse, Chas. O'H., Greenville (Hon.); Univ. of Pa., 1893	1893	1894
Morrill, D. S., Farmville; Balt. Med. Coll., 1897	1897	1903
Morrill, Jenness, Falkland; Univ. of Md., 1888	1888	1900
Nobles, Jos. E., Greenville; Jeff. Med. Coll., 1899	1899	1902
Outland, C. L., Greenville; Med. Coll. of Va., 1917	1917	1920
Pace, K. B., Greenville; Jeff. Med. Coll., 1914	1914	1920
Smith, R. C., Grifton; Jeff. Med. Coll., 1923	1923	1926
Summerell, G. H., Ayden; Med. Coll. of Va., 1915	1917	1919
Thompson, Malcom D., Greenville; Univ. of Pa., 1922	1922	1926
Whitfield, Wm. Cobb, Grifton (Hon.); Univ. of Md., 1884	1884	1884
Wooten, W. I., Greenville; Jeff. Med. Coll., 1920	1920	1920

POLK COUNTY SOCIETY

President: E. McQueen Salley, Saluda; Univ. of Md., 1905	1905	1908
Secretary: A. J. Jervey, Tryon; Med. Coll. of S. C., 1905	1923	1925
Grady, Wm. Earle, Tryon; Univ. of Md. & P. & S., Balt., 1894	1895	1899
Lea, J. I., Tryon; Mich. Coll. of Med. & Surg., 1906	1916	1925
Palmer, M. C., Tryon; Med. Coll. of S. C., 1910	1911	1914

RANDOLPH COUNTY SOCIETY

President:	------	------
Secretary:	------	------
Caveness, R. L., Coleridge; Balt. Univ., 1892	1892	1925
Hayworth, C. A., Asheboro; Univ. of Md., 1913	1913	1914
Helms, T. L., Randleman; N. C. Med., 1914	1915	1917
Hubbard, Charles C., Farmer; Jeff. Med. Coll., 1888	1890	1904
Hunter, J. V., Asheboro; Univ. of Louisville, 1898	1898	1905
Lambert, W. L., Asheboro; Jeff. Med. Coll., 1921	1921	1923
Moore, Wm. James, Asheboro; P. and S., Balt., 1893	1893	1901
Myers, R. W., R. 1, Fullers; Chattanooga Med. Coll., 1897	------	1909
Redding, Alex. H., Cedar Falls; Coll. of P. and S., Balt., 1887	1889*	1904

*Registered.

Shepard, F. A., Liberty; Univ. of Tenn., 1908	1908	1919
Sumner, G. H., Asheboro; Tulane Univ., 1923	1923	1924
Tate, C. S., Ramseur; Balt. Med. Coll., 1893	1896	1914

RICHMOND COUNTY SOCIETY

President: F. B. Garrett, Rockingham; N. C. Med. Coll., 1912	1912	1914
Secretary: A. C. Everett, Rockingham; Univ. of Md., 1897	1897	1903
Bristow, C. O., Rockingham; Jeff. Med. Coll., 1918	1920	1921
Garrett, F. J., Rockingham; Univ. of Md., 1889	1887	1904
Hatcher, M. A., Hamlet; Med. Coll. of Va., 1918	1920	1921
Henry, T. B., Rockingham; Columbia Univ. Coll. P. and S., N. Y., 1917	1920	1921
Howell, W. L., Ellerbe; N. C. Med. Coll., 1910	1910	1911
James, Albert W., Hamlet; Jeff. Med. Coll., 1918	1918	1921
James, W. D., Hamlet; Jeff. Med. Coll., 1908	1908	1908
Kinsman, Henry F., Hamlet; Univ. of Vermont, 1894	1897	1904
Ledbetter, James McQ., Rockingham; Vanderbilt Univ., 1894	1894	1903
McCreary, A. B., Rockingham; Univ. of Tenn., 1922	1924	1924
McIntosh, W. R., Rockingham; N. C. Med. Coll., 1913	1916	1917
Maness, J. M., Ellerbe; Univ. of N. C., 1909	1909	1910
Parsons, W. H., Ellerbe; N. C. Med. Coll., 1916	1916	1919
Teague, S. E., Hamlet; Tulane Univ. of La., 1921	1921	1925
Terry, Wm. Calvin, Hamlet; N. C. Med. Coll., 1911; Univ. of Md., 1912	1912	1914
Webb, W. P., Rockingham; Med. Coll. of S. C., 1897	1897	1904

ROBESON COUNTY SOCIETY

President: J. Fred Nash, St. Pauls; N. C. Med. Coll., 1914	1914	1916
Secretary: W. E. Evans, Rowland; Med. Coll. of Va., 1894	1894	1904
Andrews, Nathan H., Rowland; N. C. Med. Coll., 1911	1911	1912
Baker, Horace M., Lumberton; Harvard Med. School, 1917	1919	1919
Beam, R. S., Lumberton; Jeff. Med. Coll., 1912	1912	1915
Bowman, E. L., McDonalds; Med. Coll. of Va., 1914	1914	1916
Britt, J. N., Lumberton; Atlanta Med. Coll., 1914	1923	1924
Brown, J. P., Fairmont; Univ. of Md., 1883	1889*	1893
Carmichael, Thaddeus W., Rowland; Ky. Univ. Med. Dept., 1904	1911	1919
Costner, Thos. F., Lumberton; Jeff. Med. Coll., 1882	1889*	1918
Hardin, E. R., Lumberton; Univ. of Ga., 1911	1915	1920
Hays, A. H., Fairmont; Atlanta Med., 1917	1917	1919
Hodgin, H. H., Red Springs; Univ. of Md., 1905; N. C. Med. Coll., 1906	1906	1907
Holmes, A. B., Fairmont; Jeff. Med. Coll., 1910	1910	1914
Johnson, C. T., Red Springs; Jeff. Med. Coll., 1920	1920	1922
Johnson, Thomas C., Lumberton; Med. Coll. of Va., 1903	1903	1903
Knox, John, Jr., Lumberton; Univ. of Md., 1906	1907	1907
McClelland, Joseph O., Maxton; Med. Coll. of Va., 1908	1912	1913
McMillan, Benj. F., Red Springs (Hon.); Univ. of Md., 1882	1884	1884
McMillan, E. G., Maxton; Univ. of Tulane, 1919		1926
McMillan, R. D., Red Springs; Univ. of Md., 1910	1911	1912

*Registered.

Martin, J. A., Lumberton; Med. Coll. of Va., 1915	1915	1917
Morris, Carlyle, Maxton; Univ. of Pa., 1922	1922	1924
Poole, Claud T., St. Pauls; N. C. Med. Coll., 1909	1909	1913
Pope, Henry T., Lumberton; N. C. Med. Coll., 1894	1893	1902
Price, H. L., Fairmont; N. C. Med. Coll., 1914	1914	1920
Ricks, Leonard E., Fairmont; Med. Coll. of Va., 1896	1896	1913
Rozier, R. G., St. Pauls; Univ. of Md., 1899	1899	1904
Smith, John McNeill, Rowland; Jeff. Med. Coll., 1908	1908	1909
Stamps, Thos., Lumber Bridge (Hon.); Univ. of Louisville, 1888	1888	1890
Whitehead, S. L., Lumberton; Jeff. Med. Coll., 1921	1921	1923

ROCKINGHAM COUNTY SOCIETY

President:		
Secretary: Miles B. Abernathy, Reidsville; N. C. Med. Coll., 1906	1906	1910
Boaz, Thos. A., Stoneville; Coll. of P. & S., Balt., 1892	1892	1905
Carter, P. C., Madison; Univ. of Md., 1916	1916	1920
Casteen, Kenan, Leaksville; Univ. & Bellevue Hosp. Med. Coll., 1918	1919	1921
Cummings, M. P., Reidsville; Jeff. Med. Coll., 1911	1911	1914
Dicks, James F., Stoneville; Univ. Coll. Med., Va., 1901	1901	1905
Dillard, G. P., Draper; Bennett Med. Coll., 1916	1916	1919
Dixon, Hubert C., Madison; Univ. and Bellevue Hosp. Med. Coll., 1916	1916	1921
Fetzer, P. W., Madison; Univ. of Va. Dept. of Med., 1916	1916	1920
Jett, Samuel G., Reidsville; Univ. of the South, 1903	1908	1911
Johnson, W. A., Reidsville, R. F. D.; N. C. Med. Coll., 1907	1909	1910
McBryde, M. H., Reidsville; Univ. Coll. of Med., Richmond, 1901	1901	1904
McGehee, John Wm., Reidsville; Univ. of Md., 1904	1904	1905
Martin, Sydnor L., Leaksville; Balt. Med. Coll., 1892	1892	1904
Matthews, Wm. W., Spray; Chicago Coll. of Med. and Surg., 1913	1915	1918
Ray, John B., Leaksville; Balt. Med. Coll., 1898	1898	1898
Taylor, James T., Madison; Univ. of Md., Coll. of P. & S., Balt., 1908	1908	1910
Taylor, T. G., Leaksville; Ky. School of Med., 1877	1909*	1910
Tuttle, A. F., Spray; N. C. Med. Coll., 1901	1901	1907
Tyner, Carl V., Leaksville; Univ. and Bellevue Hosp. Med. Coll., N. Y., 1916	1916	1919
Webb, M. L., Mayodan; Atlanta School of Med., 1909	1924	1925
Webb, S. Edgar, Draper; Univ. of N. C., 1908	1908	1916
Wilson, W. P., Madison; N. C. Med. Coll., 1908	1908	1916

ROWAN COUNTY SOCIETY

President: John H. Peeler, Salisbury; Va. Univ. Coll. of Med., 1899	1899	1904
Secretary: Harold H. Newman, Salisbury; Johns Hopkins Univ., 1913	1914	1916
Armstrong, C. W., Salisbury; Univ. of Md., 1914	1914	1915

*Registered.

Black, O. R., Landis; N. C. Med. Coll., 1914	1914	1918
Boger, D. T., Rockwell; N. C. Med. Coll., 1906	1906	1921
Boyden, Wm. C., China Grove; N. C. Med. Coll., 1913	1913	1914
Brawley, M. H., Salisbury; N. C. Med. Coll., 1910	1912	1914
Brawley, Robert V., Salisbury; Univ. Coll. of Med., Va., 1901	1901	1904
Brown, Clarence E., Faith; N. C. Med. Coll., 1918	1920	1921
Brown, G. A., Mt. Ulla; Univ. Coll. of Med., 1897	1897	1898
Busby, Julian G., Salisbury; Univ. of Md., 1904	1904	1905
Choate, Glenn Wm., Salisbury; N. C. Med. Coll., 1909	1909	1909
Choate, J. W., Salisbury; N. C. Med. Coll., 1915	1915	1924
Clement, Edward B., Salisbury; Jeff. Med. Coll., 1906	1906	1913
Council, J. B., Salisbury (Hon.); P. and S., Balt., 1885	1885	1885
Eagle, J. C., Spencer; Jeff. Med. Coll., 1923	1923	1925
Ellis, Frank A., Salisbury; Univ. of Pa., 1918	1919	1919
Flemming, G. M., Cleveland; Emory Univ. School of Med., 1919	1919	1921
Heilig, Herman G., Salisbury; Univ. of Md., 1899	1899	1904
Higgins, L. M., Salisbury; Johns Hopkins, 1920	1925	1926
Ketchie, J. M., Salisbury; Jeff. Med. Coll., 1922	1922	1925
McKenzie, B. W., Salisbury; Jeff. Med. Coll., 1916	1916	1920
McKenzie, Wm. W., Salisbury (Hon.); Jeff. Med. Coll., 1893	1893	1894
Marsh, Frank B., Salisbury; Jeff. Med. Coll., 1919	1919	1922
Monk, Henry L., Salisbury; Med. Coll. of Va., 1897	1899	1903
Plyler, R. J., Salisbury; Univ. of Md., 1921	1924	1925
Ramsay, Jas. G., Salisbury; Univ. of Pa., 1922	1924	1924
Seay, T. W., East Spencer; Univ. of Md., 1921	1922	1924
Shafer, Irving E., Salisbury; N. C. Med. Coll., 1914	1914	1914
Sigman, Frederick G., Spencer; Univ. Med. Coll. of Va., 1909	1909	1910
Slate, Wesley C., Spencer; Univ. of Tenn., 1903	1903	1913
Spencer, Frederick B., Salisbury; Univ. of N. C., 1909	1909	1911
Stokes, Jas. Ernest, Salisbury; Univ. of Md., 1892	1900	1901
Summerell, E. M., China Grove (Hon.); Univ. of Pa., 1883	1883	1883
Tatum, Walter Lowe, Salisbury; Jeff. Med. Coll., 1922	1922	1924
Trantham, H. T., Salisbury (Hon.); Univ. of N. Y., 1875	1879	1879
Van Poole, C. M., Salisbury (Hon.); P. and S., Balt., 1880	1880	1880
Van Poole, Carl M., Jr., China Grove; Univ. of Md., 1916	1917	1925
West, Robert M., Salisbury; Med. Coll. of Va., 1900	1900	1904
Woodson, Charles W., Salisbury; Columbia Univ., P. and S., N. Y., 1904	1905	1907

RUTHERFORD COUNTY SOCIETY

President: D. P. Murphy, Rutherfordton; Univ. of Pa., 1916	1922	1923
Secretary: Wm. C. Bostic, Forest City; Chattanooga Med. Coll. 1899; N. C. Med. Coll., 1905	1905	1905
Allhands, John M., Cliffside; Chicago Coll. of Med. and Surg., 1910	1910	1911
Andrews, Robert M., Bostic; Memphis Hosp. Med. Coll., 1901	1904	1905
Biggs, Montgomery H., Rutherfordton; Univ. of Pa., 1897	1907	1908
Buchanan, C. L., Union Mills; Tennessee Medical Coll., 1910	1910	1914
Crawford, Robt. H., Rutherfordton; Johns Hopkins, 1914	1920	1921

Duncan, Amos C., Forest City; Univ. of Va., 1919	1919	1920
Gold, Charles F., Ellenboro; Univ. of N. C., 1910	1910	1911
Harrill, L. B., Caroleen; Chattanooga Med. Coll., 1897	1902	1904
Head, W. T., Campobello, S. C., Rt. 4; Atlanta Coll. P. and S., 1911	1911	1923
Hicks, Romeo, Henrietta; Southern Med. Coll., Atlanta, 1888	1889*	1899
Hunt, J. F., Spindale; Univ. of Tenn., 1900	1900	1912
Logan, F. W. F., Rutherfordton; N. C. Med. Coll., 1916	1916	1919
Lovelace, Thos. C., Henrietta; N. C. Med. Coll., 1917	1920	1920
Norris, Henry, Rutherfordton; Univ. of Pa., 1906	1907	1908
Reid, George P., Forest City; Univ. Coll. of Med., Va., 1895	1894	1899
Rucker, Adin Adam, Rutherfordton; Univ. of Md., 1908	1908	1909
Scruggs, F. B., Cliffside; Jeff. Med. Coll., 1919	1919	1922
Thompson, W. A., Rutherfordton; P. and S., Balt., 1885	1889*	1904
Twitty, John C., Rutherfordton; Balt. Med. Coll., 1892	1892	1904
Wiseman, P. H., Avondale; Med. Coll. of Va., 1925	1925	1926

SAMPSON COUNTY SOCIETY

President: J. Street Brewer, Roseboro; Jeff. Med. Coll., 1919	1919	1921
Secretary: Victor R. Small, Clinton; Ohio State Univ. Med. Coll., 1916	1920	1921
Crumpler, Paul, Clinton; Univ. of Tenn., 1907	1907	1908
Hollingsworth, E. T., Clinton; N. C. Med. Coll., 1912	1912	1915
Kerr, John D., Clinton; Univ. of Md., 1908	1908	1910
Lee, J. Marshall, Newton Grove; Med. Coll. of Va., 1916	1920	1923
Matthews, James O., Clinton, R. F. D.; Univ. Coll. of Med., Va., 1879	1879	1902
Parker, J. R., Clinton; Baltimore Med. Coll., 1898	1898	1919
Parker, O. L., Clinton; Med. Coll. of Va., 1918	1918	1919
Sessoms, E. T., Roseboro; N. C. Med. Coll., 1915	1915	1917
Sikes, Gibson L., Salemburg; Univ. Coll. of Med., Va., 1900	1900	1902
Sloan, Wm. H., Garland; Univ. of Maryland, 1916	1916	1920
Underwood, O. E., Roseboro; Univ. Coll. of Med., Va., 1909	1909	1910
Wilson, Robert B., Newton Grove; Ky. School of Med., 1889	1889	1904

SCOTLAND COUNTY SOCIETY

President: W. G. Shaw, Wagram; P. and S., Balt., 1892	1895	1904
Secretary: Marcus B. Wilkes, Laurel Hill; N. C. Med. Coll., 1912	1923	1923
Buchanan, L. T., Laurinburg; Jeff. Med. Coll., 1913	1913	1917
Erwin, Evan A., Laurinburg; Med. Coll. of S. C., 1912	1912	1913
Gibson, John S., Gibson; Univ. of Md., 1905	1905	1907
James, F. P., Laurinburg; Univ. of Pa., 1916	1916	1917
John, Peter, Laurinburg; Univ. of Md., 1897	1897	1904
Livingston, Everett Alex, Gibson; Univ. of Md., 1912	1912	1913
McLean, Allen, Wagram; Univ. of Md., 1908	1908	1911
McLean, Peter, Laurinburg; Univ. of Md., 1906	1907	1908
Pate, James G., Gibson; Univ. of Pa., 1916	1916	1917
Wilcox, J. W., Laurel Hill; Univ. of N. C., 1906	1906	1906

*Registered.

STANLY COUNTY SOCIETY

President: W. T. Shaver, Badin; Univ. of Md., 1918	1920	1921
Secretary: Julius Clegg Hall, Albemarle; Univ. Coll. of Med., Va., 1899	1899	1908
Allen, Jos. A., New London; Univ. Coll. of Med., Va., 1901	1901	1904
Campbell, Jas. I., Norwood; N. C. Med. Coll.	1898	1904
Cox, Benj. F., Palmerville; Coll. of P. and S., Balt., 1886	1886	1908
Dunlap, Lucius Victor, Albemarle; Univ. of N. C., 1909	1909	1910
Gaskin, Lewis R., Albemarle; Med. Coll. of State of S. C., 1921	1924	1926
Hartsell, F. E., Oakboro; Balt. Med. Coll., 1895	1895	1902
Hathcock, Thomas A., Norwood; Univ. of Md., 1893	1893	1904
Hill, Wm. Isaac, Albemarle; Univ. of Md. and P. and S., Balt. 1897	1897	1904
Laton, James F., Albemarle; N. C. Med. Coll., 1904	1904	1910
Lentz, C. M., Albemarle; N. C. Med. Coll., 1909	1909	1910
Moore, D. Bain, Badin; Univ. Coll. of Med., Va., 1913	1913	1915

STOKES COUNTY SOCIETY

President		
Secretary:		
Hanes, J. L., Pine Hall; Univ. of Maryland, 1902	1902	1920
Helsabeck, C. J., Walnut Cove; Univ. of Md., 1919	1919	1922
Helsabeck, R. S., Mizpah; N. C. Med. Coll., 1913	1913	1920
Jones, A. G., Walnut Cove (Hon.); Univ. of N. Y., 1868	1894*	1892
Stone, Grady E., King; N. C. Med. Coll., 1915	1915	1920

SURRY COUNTY SOCIETY

President: James T. Smith, Westfield; N. C. Med. Coll., 1898	1899	1918
Secretary: R. C. Mitchell, Mt. Airy; Univ. of Pa., 1919	1921	1923
Ashby, E. C., Mt. Airy; Univ. of Pa., 1914	1914	1916
Baird, C. A., Mt. Airy; N. C. Med. Coll., 1904	1904	1912
Bernard, Holman, Pinnacle; Med. Coll. of Va., 1912	1914	1919
Flippin, Samuel T., Siloam; N. C. Med. Coll., 1898	1898	1898
Garvey, R. R., Elkin; N. C. Med. Coll., 1915	1915	1919
Hollingsworth, Edward M., Mt. Airy; Coll. of P. and S., Baltimore, 1886	1886	1904
Lovill, Robert Jones, Mt. Airy; Univ. of Md., 1910	1910	1912
Martin, Moir S., Mt. Airy; Univ. Coll. of Med., Va., 1905	1909	1916
Ring, Joseph W., Elkin; P. and S., Balt., 1880	1890*	1904
Royall, M. A., Elkin; P. and S., Balt., 1885	1889*	1913
Salmons, H. C., Elkin; N. C. Med. Coll., 1904	1904	1908
Smith, Jas. B., Pilot Mt. (Hon.); P. and S., Balt., 1885	1889*	1896
Stone, Wesley M., Dobson; N. C. Med. Coll., 1906	1906	1907
Taylor, William S., Mt. Airy; Jeff. Med. Coll., 1873	1889*	1894
Woltz, J. L., Mt. Airy; Southern Med. Coll., 1897	1902	1904

SWAIN COUNTY SOCIETY

President:		
Secretary:		
Tidmarsh, H. W., Whittier; Univ. of N. C., 1914	1916	1920

*Registered.

TRANSYLVANIA COUNTY SOCIETY

President:		
Secretary:		
English, Edwin S., Brevard; Univ. of the South, 1901	1902	1904
Lyday, Abram E., Penrose; Lincoln Mem. Univ., 1891	1909	1904
Lyday, Wm. Monroe, Brevard; Coll. of P. and S., 1885	1889*	1904
Summey, T. J., Brevard; Jeff. Med. Coll., 1915	1915	1916

UNION COUNTY SOCIETY

President: A. D. N. Whitley, Monroe; Univ. of Md., 1897	1897	1904
Secretary: Raymond Pearson, Monroe; N. C. Med. Coll., 1922	1923	1924
Ashcraft, J. E., Monroe; Univ. of N. Y., 1887	1887	1890
Blair, M. P., Marshville; Med. Coll. of Va., 1895	1895	1895
Bynum, C. M., Marshville; Med. Coll. of Va., 1914	1914	1918
Ezzell, S. H., Waxhaw; Atlanta Coll. of P. & S., 1900	1910	1906
Garren, R. H., Monroe; Univ. of Nashville, 1900	1901	1904
Goudelock, Jno. J., Monroe; Med. Coll. of S. C., 1923	1924	1924
Love, William M., Monroe; N. C. Med. Coll., 1915	1915	1919
Mahoney, A. F., Monroe; Univ. Louisville, 1911	1923	1924
Neal, John W., Monroe; N. Y. Univ. Med. Coll., 1884	1887	1904
Payne, R. L., Monroe; Tulane Univ., 1911	1911	1912
Perkins, David R., Marshville; Balt. Med. Col., 1903	1906	1907
Pruitt, G. C., Monroe; Atlanta Coll. of P. & S., 1911	1920	1920
Richardson, Jas. C., Monroe; Vanderbilt Univ., 1920	1920	1923
Smith, G. M., Monroe; N. C. Med. Coll., 1914	1914	1919
Stevens, Samuel A., Monroe; Univ. of Md., 1900	1898	1898
Stewart, H. D., Monroe; Univ. of Md., 1898	1898	1904
Williams, Edward J., Monroe; Univ. and Bellevue Hosp. Med. Coll., 1917	1920	1921

VANCE COUNTY SOCIETY

President:		
Secretary: J. H. Wheeler, Henderson; Jeff. Med. Coll., 1918	1918	1920
Allen, Benjamin G., Henderson; Columbia Univ., 1904	1904	1908
Bass, H. H., 2215 Walnut St., Philadelphia; Univ. Coll. of Med., 1899	1899	1900
Cheatham, Goode, Henderson; N. C. Med. Coll., 1895	1895	1920
Fenner, Edwin F., Henderson; Univ. of Md., 1905	1906	1908
Furman, Wm. H., Henderson; Jeff. Med. Coll., 1910	1910	1912
Gill, Robt. J., Henderson; Univ. of Pa., 1867	1889*	1900
Harris, Fletcher R., Henderson (Hon.); Univ. of Va., 1881	1883	1883
Newcombe, A. P., Jr., Henderson; Jeff. Med. Coll., 1922	1922	1924
Newell, H. A., Henderson; P. and S., Balt., 1906	1906	1907
Royster, Thomas S., Henderson; Univ. of Pa., 1916	1916	1924
Upchurch, Robert T., Henderson; Jeff. Med. Coll., 1908	1908	1910

WAKE COUNTY SOCIETY

President: T. E. Wilkerson, Jr., Raleigh; Univ. of Pa., 1914	1914	1916
Secretary: Louis N. West, Raleigh; Jeff. Med. Coll., 1912	1912	1915
Abernethy, Claude O., Raleigh; Univ. of N. C., 1906	1906	1907

*Registered.

Adams, R. K., Raleigh; Jeff. Med. Coll., Phila., 1912	1912	1916
Anderson, Albert, Raleigh (Hon.); Univ. of Va., 1888	1889	1890
Ashby, J. W., Raleigh; Univ. of Md., 1905	1921	1922
Barbee, G. S., Zebulon; Univ. of N. C., 1910	1910	1912
Bell, Carl W., Raleigh; Coll. of P. and S., Balt., 1914	1915	1916
Brackin, H. B., Raleigh; Univ. of Tenn., 1921	1923	1925
Buffaloe, J. S., Garner; Balt. Med. Coll., 1900	1900	1904
Bugg, C. R., Raleigh; Johns Hopkins Med. Sch., 1922	1924	1925
Bulla, A. C., Raleigh; N. C. Med. Coll., 1915	1915	1918
Burt, B. W., Holly Springs; P. and S., Balt., 1886	1886	1904
Campbell, Alton C., Raleigh; Univ. of N. C., 1910	1910	1912
Carroll, E. D. Dixon, Raleigh; Woman's Med. Coll., N. Y., 1895	1900	1900
Caveness, Zebulon M., Raleigh; Univ. of N. C., 1903	1903	1903
Caviness, V. S., Raleigh; Jeff. Med. Coll., 1921	1921	1925
Cheek, C. E., Fuquay Springs; Univ. Coll. of Med., Va., 1912	1912	1914
Cooper, G. M., Raleigh; Univ. Coll. of Med., Richmond, 1905	1905	1906*
Cozart, W. S., Fuquay Springs; Med. Coll. of Va., Rich., 1914	1914	1917
Dewar, Wm. B., Raleigh; Univ. of Pa., 1920	1920	1923
Edwards, C. J., Raleigh; Med. Coll. of Va., 1917	1921	1923
Finch, O. E., Raleigh; Jeff. Med. Coll., 1915	1915	1917
Flowers, Clarence A., Wendell; P. and S., Balt., 1905	1907	1910
Flowers, C. E., Zebulon; Med. Coll. of Va., 1913	1915	1916
Foley, C. E., Raleigh; Univ. Med. Coll., Richmond, 1913	1924	1925
Fowler, M. L., Zebulon; Coll. of P. and S., Balt., 1881	1889*	1904
Freeman, R. H., Raleigh; Jeff. Med. Coll., 1908	1908	1919
Gibson, M. R., Raleigh; Univ. of Md., 1905	1905	1914
Goodwin, A. W., Raleigh (Hon.); Bellevue Hosp. Med. Coll., 1887	1887	1887
Goodwin, O. S., Raleigh; Jeff. Med. Coll., 1923	1923	1926
Griffin, Thos. A., Wendell; Univ. of Md., 1912	1913	1923
Haywood, Hubert, Raleigh (Hon.); Bellevue Hosp. Med. Coll., 1879	1879	1879
Haywood, Hubert B., Jr., Raleigh; Univ. of Pa., 1909	1909	1910
Hester, Jos. R., Knightdale; Univ. of N. C., 1910	1910	1912
Hicks, V. M., Raleigh; Jeff. Med. Coll., 1918	1918	1921
Horton, M. C., Raleigh; Univ. Coll. of Med., Va., 1903	1911	1911
Horton, W. C., Raleigh; P. and S., Balt., 1897	1896	1904
Jenkins, Charles L., Raleigh (Hon.); N. Y. Univ. Med. Coll., 1890	1890	1894
Jordan, Thos. M., Raleigh (Hon.); P. and S., Balt., 1881	1881	1882
Judd, Eugene C., Raleigh; Univ. of Pa., 1911	1911	1912
Judd, James M., Varina; Balt. Med. Coll., 1897	1897	1901
Kitchin, Thurman D., Wake Forest; Jeff. Med., 1908	1908	1908
Knox, Augustus W., Raleigh (Hon.); Bellevue Hosp. Med. Coll., 1874	1878	1880
Lane, Bessie, Raleigh; Woman's Med. Coll. of Pa., 1921	1921	1926
Lawrence, B. J., Raleigh; Jeff. Med. Coll., 1918	1918	1920
Lewis, Richard H., Raleigh, (Hon.); Univ. Md., 1871	1877	1877
Long, E. F., Raleigh; Med. Coll. of Va., 1909	1909	1912

*Registered.

Lowery, John R., Raleigh; Univ. of Md., 1904	1904	1913
McCuiston, A. M., Raleigh; N. C. Med. Coll., 1911	1911	1917
McDowell, F. C., Zebulon; Univ. of Pa., 1902	1913	1916
McGee, James Wm., Raleigh (Hon.); Bellevue Hosp. Med. Coll., 1888	1888	1888
Mitchener, J. S., Raleigh; Johns Hopkins Univ., 1915	1915	1918
Neal, Kemp P., Raleigh; Harvard, 1917	1920	1921
Neal, Paul N., Raleigh; Harvard, 1919	1920	1921
Noble, R. P., Raleigh; Univ. of N. C., 1907	1907	1916
Procter, I. M., Raleigh; Univ. of N. C., 1913; Univ. of Pa., 1915	1915	1917
Ray, O. L., Raleigh, Rt. 1; Univ. Coll. of Med., Richmond, 1899	1899	1904
Register, F. M., Raleigh; Ky. School of Med., 1893	1891	1918
Rogers, Jas. Rufus, Raleigh; P. and S., Balt., 1886	1886	1904
Root, Aldert S., Raleigh; Univ. of Pa., 1911	1911	1913
Royster, Hubert A., Raleigh (Hon.); Univ. of Pa., 1894	1894	1895
Royster, W. I., Raleigh (Hon.); Bellevue Hosp. Med. Coll., N. Y., 1869	1869	1874
Shore, Clarence A., Raleigh; Johns Hopkins, 1908	1909	1909
Soady, J. H., Garner; McGill Univ., 1903; Toronto Univ., 1905	1924	1926
Strickland, W. M., Wendell; Med. Coll. of Va., 1919	1921	1923
Templeton, James M., Cary; Balt. Med. Coll., 1882	1882	1893
Thompson, Hugh A., Raleigh; Univ. of Pa., 1914	1914	1917
Turner, H. G., Raleigh; Univ. of Pa., 1906	1907	1925
Vann, H. M., Wake Forest; Jeff. Med. Coll., 1917	1920	1923
Washburn, B. E., Kingston, Jamaica; Univ. Va., 1911	1912	1917
Watson, John B., Raleigh; Univ. of N. C., 1908	1908	1909
Wilkins, R. B., Raleigh; N. C. Med. Coll., 1913	1913	1915
Wilkerson, Charles B., Raleigh; Univ. of N. C., 1906	1906	1908
Wilkinson, C. T., Wake Forest; Tulane Univ., 1922	1922	1923
Wilkinson, R. W., Jr., Wake Forest; Tulane Univ., 1922	1923	1924
Wright, J. B., Raleigh; Univ. Coll. of Med., Va., 1899	1899	1900
Yarborough, Frank, Cary; Univ. of Penn., 1923	1925	1926
Young, L. B., Wake Forest, Rt. 3; P. and S., Balt., 1886	1886	1906

WARREN COUNTY SOCIETY

President: F. S. Packard, Norlina; Med. Sch. of Maine, 1887	1907	1922
Secretary: W. D. Rodgers, Warrenton; Jeff. Med. Coll., 1913	1913	1915
Foster, H. H., Norlina; Jeff. Med. Coll., 1919	1919	1923
Holt, T. J., Warrenton; Med. Coll. of Va., 1904	1904	1911
Macon, G. H., Warrenton; Univ. Coll. of Med., Va., 1910	1910	1911
Peete, C. H., Warrenton; Univ. of Pa., 1903	1906	1911

WASHINGTON-TYRRELL COUNTIES SOCIETY

President: John W. Speight, Roper; Ky. School of Med., 1885	1885	1904
Secretary: T. L. Bray, Plymouth; Univ. of Md., 1916	1916	1919
Chapin, S. C., Columbia	-------	-------
Halsey, Benj. F., Roper (Hon.); Vanderbilt Univ., 1893	1895	1894
McGowan, Claudius, Plymouth; Med. Coll. of Va., 1917	1917	1922
Mariner, N. B., Belhaven; Univ. Coll. of Med., Va., 1903	1903	1903
Norman, J. Standing, Columbia; P. and S., Balt., 1909	1911	1920
Ward, William H., Plymouth (Hon.); Univ. of Md., 1881	1886	1886

WAYNE COUNTY SOCIETY

President: Wm. G. Sutton, Seven Springs; Jeff. Med. Coll., 1889	1889	1896
Secretary: A. G. Woodard, Goldsboro; Univ. of N. C., 1907	1907	1909
Best, D. E., Goldsboro; Univ. of Md., 1924	1924	1926
Bizzell, M. E., Goldsboro; Tulane Univ., 1923	1923	1925
Bizzell, Thomas M., Goldsboro; Univ. of Md., 1908	1908	1916
Cobb, Donald, Goldsboro; Univ. of Pa., 1921	1921	1926
Cobb, W. H., Jr., Goldsboro; Jeff. Med. Coll., 1889	1889	1890
Corbett, L. W., Goldsboro; Med. Coll. of S. C., 1915	1925	1924
Crawford, W. B., Goldsboro; Bellevue Hosp., N. Y., 1886	1886	1890
Crawford, W. J., Goldsboro; Med. Coll. of Va., 1922	1922	1923
Faison, Wm. W., Goldsboro (Hon.); Jeff. Med. Coll., 1878	1883	1883
Ginn, Theo. L., Goldsboro; Med. Coll. of Va., 1901	1901	1904
Henderson, C. C., Mt. Olive; Univ. of Md., 1914	1914	1919
Henderson, T. B., Goldsboro; Med. Coll. of Va., 1906	1914	1915
Irwin, Henderson, Goldsboro; Univ. of Md., 1912	1914	1916
Ivey, H. B., Goldsboro; Univ. Coll. of Med., Richmond, 1911	1911	1917
Lassiter, C. L., Fremont; Jeff. Med. Coll., 1915	1915	1918
Linville, W. C., Goldsboro; Univ. of Md., 1903	1903	1923
Miller, Robert B., Goldsboro; Med. Coll. of Va., 1898	1900	1902
Morris, George B., Goldsboro; Univ. of Md., 1910	1910	1912
Morris, G. Dillon, Goldsboro; Univ. of Pa., 1924	1924	1926
Parker, S. F., Mount Olive; Med. Coll. of Va., 1901	1918	1922
Person, Edgar Cooper, Pikeville; Med. Coll. of Va., 1905	1905	1908
Person, H. M., Goldsboro; N. C. Med. Coll., 1913	1913	1916
Rose, David J., Goldsboro; Tulane Univ., 1922	1922	1924
Smith, R. A., Goldsboro (Hon.); Bellevue Hospital, 1882	1882	1887
Smith, Wm. H., Goldsboro; Univ. of Pa., 1906	1907	1912
Spicer, John, Goldsboro; Bellevue Med. Coll., 1889	1890	1904
Spicer, William, Goldsboro; Bellevue Hosp. Med. Coll., 1898	1897	1904
Steel, Wm. C., Mt. Olive; Univ. of Md., 1891	1891	1894
Strosnider, Charles F., Goldsboro; Univ. of Md., 1909	1910	1913
Warrick, L. A., Goldsboro; Geo. Washington Univ., 1923	1923	1924
Whelpley, Frank L., Goldsboro; Missouri Univ., 1902	1918	1918
Wilkins, J. W., Mt. Olive; Med. Coll. of Va., 1913	1913	1917

WILKES COUNTY SOCIETY

President: Frank H. Gilreath, N. Wilkesboro; Univ. of Nashville, 1898	1898	1898
Secretary: Julian E. Duncan, N. Wilkesboro; Univ. Coll. of Med., Richmond, 1907	1907	1908
Craven, F. C., N. Wilkesboro; Univ. of Md., 1913	1913	1914
Eller, Albert J., Readybranch; P. and S., Balt., 1893	1895	1898
Hutchins, E. M., N. Wilkesboro; N. C. Med. Coll., 1896	1896	1904
Sink, C. S., North Wilkesboro; N. C. Med. Coll., 1912	1912	1913
Somers, L. P., New Castle; Univ. of Md., 1897	1889*	1904
Triplett, W. R., Purlear; N. C. Med. Coll., 1914	1915	1920
White, John W., Wilkesboro (Hon.); Jeff. Med. Coll., 1889	1889	1890

*Registered.

WILSON COUNTY SOCIETY

President: E. C. McClees, Elm City; Med. Coll. of Va., 1917	1920	1920
Secretary: C. L. Swindell, Wilson; Univ. of Md., 1909	1909	1920
Anderson, Wade H., Wilson; Univ. of Va., 1902	1904	1904
Anderson, Wm. S., Wilson; Wash. Univ., Balt., 1868	1889*	1900
Barnes, Benjamin F., Elm City; Univ. of Md., 1902	1902	1902
Bell, G. E., Wilson; Jeff. Med. Coll., 1921	1921	1922
Best, Henry B., Wilson; Univ. of N. C., 1907	1907	1908
Blackshear, T. J., Wilson; Emory Univ., 1914	1923	1924
Bradshaw, T. G., Wilson; Med. Coll. of Va., 1909	1924	1924
Brooks, G. M., Elm City; Jeff. Med. Coll., 1918	1919	1919
Darden, D. B., Stantonsburg; Univ. of Pa., 1921	1924	1926
Eagles, Charles S., Saratoga; Univ. of N. C., 1909	1909	1910
Grady, Leland V., Wilson, Rt. 2; N. C. Med. Coll., 1913	1913	1914
Hackney, Ben H., Lucama; Tulane Univ., 1911	1911	1913
Herring, Benj. S., Wilson; Univ. of Mich., 1900	1901	1901
Hoover, H. R., Wilson; Balt. Med. Coll., 1891	1892	1904
Lamm, Isaac W., Lucama; Univ. Coll. of Med., Va., 1899	1899	1900
Lane, P. P., Wilson; Univ. of Md., 1908	1908	1920
Lewis, Geo. W., Wilson (Hon.); Univ. of Md., 1886	1885	1894
Marlowe, W. H., Wilson	------	------
Mitchell, Geo. W., Wilson; Univ. Coll. of Med., Rich., 1913	1913	1920
Moore, Chas. E., Wilson (Hon.); Bellevue Hosp. Med. Coll., 1875	1875	1875
Moore, Edwin G., Elm City (Hon.); Univ. of Md., 1883	1883	1890
Moore, K. C., Wilson; Univ. of Mich., 1909	1909	1910
Person, T. E., Stantonsburg; N. C. Med. Coll., 1911	1911	1914
Powell, H. H., Stantonsburg; Med. Coll. of Va., 1911	1911	1914
Putney, R. H., Elm City; Med. Coll. of Va., 1914	1914	1920
Saliba, Michael M., Wilson; Balt. Med. Coll., 1897	1910	1910
Smith, A. Jones, Black Creek; Univ. of Pa., 1921	1921	1923
Smith, L. J., Wilson; Jeff. Med. Coll., 1912	1917	1918
Strickland, Ernest L., Wilson; Med. Coll. of Va., 1916	1916	1917
Williams, Albert F., Wilson; Univ. of Md., 1901	1901	1904
Willis, H. C., Wilson; Memphis P. and S., 1911	1916	1924
Woodard, C. A., Wilson; Univ. of Va., 1904	1904	1920

YADKIN COUNTY SOCIETY

President:	------	------
Secretary:	------	------
Bryant, Charles G., Jonesville; Louisville Med. Coll., 1894	1903*	1904
Leak, Wharton G., East Bend; N. C. Med. Coll., 1900	1899	1904

YANCEY COUNTY SOCIETY

President:	------	------
Secretary:	------	------
Gibbs, J. B., Burnsville; Tenn. Med. Coll., 1900; N. C. Med. Coll., 1904	1904	1919
Peek, W. A., Ramseytown; non-graduate	1905*	1919

*Registered.

ALPHABETICAL LIST OF MEMBERS OF MEDICAL SOCIETY

WITH POSTOFFICE ADDRESSES

*Present at 1926 Meeting at Wrightsville Beach

Name	*Address*
*Abel, J. F.	Waynesville
*Abernethy, Claude O.	Raleigh
Abernathy, H. N.	Charlotte
Abernathy, Miles B.	Reidsville
*Abernethy, E. A.	Chapel Hill
Achorn, John W.	Pinebluff
Adams, C. A.	Durham
Adams, Charles E.	Gastonia
Adams, Edw. E.	Murphy
Adams, J. L.	Asheville
Adams, L. C.	LaGrange
*Adams, M. R. (Hon.)	Statesville
Adams, N. B.	Murphy
*Adams, R. K.	Raleigh
Adkins, M. T.	Durham
Alexander, Annie L. (Hon.)	Charlotte
Alexander, Geo.	Asheville
Alexander, James R	Charlotte
Alexander, M. Janet	Montgomery India (Mecklenburg Co.)
*Allan, William	Charlotte
Allen, Benjamin G.	Henderson
Allen, Chas. I.	Wadesboro
Allen, Jos. A.	New London
Allen, Rufus L.	Waynesville
*Allgood, R. A.	Fayetteville
Allhands, John M.	Cliffside
Ambler, Arthur C.	Asheville
Ambler, Chas. P. (Hon.)	Asheville
Anders, McT. G.	Gastonia
Anderson, Albert (Hon.)	Raleigh
Anderson, Chas. A.	Burlington
Anderson, James A.	Gastonia
Anderson, James G.	Asheville
*Anderson, Thos. Eli (Hon.)	Statesville
*Anderson, Wade H.	Wilson
Anderson, Wm. S.	Wilson
Andrews, Nathan H.	Rowland
Andrews, Robert M.	Bostic
Angel, Frank	Franklin
Anthony, J. E.	Kings Mountain
Archer, Isaac J.	Black Mountain
*Armstrong, C. W.	Salisbury
Ashby, E. C.	Mount Airy
Ashby, J. W.	Raleigh
Ashcraft, J. E.	Monroe
*Ashe, J. R.	Charlotte
Ashworth, B. L.	Marion
*Ashworth, W. C.	Greensboro
Austin, D. R.	Charlotte
Austin, F. DeCosta	Charlotte
*Austin, J. W.	High Point
*Averitt, K. G.	Cedar Creek
Aycock, F. M.	Princeton
Aydlett, H. T.	Greensboro
Aydlette, Jos. P.	Earl
Baggett, Leaman	Whiteville
Baird, C. A.	Mount Airy
Baird, John W.	Mars Hill
Baker, Horace M.	Lumberton
*Baker, J. M. (Hon.)	Tarboro
Baker, W. E.	Arden
Ball, M. W.	New Bern
Bandy, W. G.	Maiden
Bangle, J. A.	Concord
*Banner, A. C.	Greensboro
Banner, Chas. W.	Greensboro
Barbee, G. S.	Zebulon
Barber, Y. M.	Macclesfield
*Barefoot, Graham B.	Chadbourn
Barker, C. S.	New Bern
Barkwell, J. H.	Weeksville
Barnes, B. F.	Elm City
*Barret, H. P.	Charlotte
*Barron, A. A.	Charlotte
*Basnight, Thos. G.	Stokes
*Bass, H. H.	Philadelphia, Pa. (Vance Co.)
*Bass, Spencer P.	Tarboro
Battle, Geo. C.	Asheville
Battle, Ivan P.	Rocky Mount
Battle, John T. J. (Hon.)	Greensboro
Battle, S. W. (Hon.)	Asheville
Baynes, R. H.	Durham
*Beall, L. G.	Black Mountain

Name	*Address*
Beall, Wm. P. (Hon.)	Greensboro
Beam, H. M.	Roxboro
*Beam, R. S.	Lumberton
*Beasley, E. B.	Fountain
Beckwith, R. P.	Roanoke Rapids
Belk, Geo. W.	Gastonia
Bell, A. E.	Mooresville
*Bell, Carl W.	Raleigh
Bell, G. E.	Wilson
Bell, J. C.	Maysville
Bellamy, Robt. H.	Wilmington
Belton, J. F.	Winston-Salem
Benbow, J. T.	Winston-Salem
*Bender, E. L.	Trenton
Bennett, Jos. H.	Wadesboro
Bennett, W. H.	Sanford
Bernard, Holman	Pinnacle
Berry, John	Greensboro
Best, Benj. W.	Greensboro
*Best, D. E.	Goldsboro
Best, Henry B.	Wilson
*Biggart, Wm. P.	Charlotte
Biggs, Montgomery H.	Rutherfordton
Billings, G. M.	Morganton
Bingham, G. D.	Sugar Grove
Bitting, Numa Duncan	Durham
*Bittinger, S. M.	Sanatorium
Bizzell, M. E.	Goldsboro
Bizzell, Thos. M.	Goldsboro
Black, George Wm.	Pineville
Black, O. R.	Landis
Blackburn, T. C.	Hickory
Blackshear, T. J.	Wilson
Blair, Andrew	Charlotte
*Blair, A. McNiel	Southern Pines
*Blair, J. L.	Gastonia
Blair, M. P.	Marshville
*Blakey, R. A.	Fayetteville
Blalock, B. K.	Charlotte
Blanchard, T. W.	Hobbsville
Blue, A. McN.	Carthage
Blue, Waylon	Jackson Springs
Boaz, Thos. A.	Stoneville
Boddie, Needham P. (Hon.)	Durham
Boger, D. T.	Rockwell
*Boice, E. S.	Rocky Mount
*Bonner, J. B.	Washington
*Bonner, K. P. B.	Morehead City
*Bonner, O. B.	High Point
*Booker, L. S.	Durham
Boone, S. B.	Jackson
Boone, W. H.	Durham
Boone, W. W.	Durham
*Bost, T. C.	Charlotte
Bostic, Wm. C.	Forest City
*Bowdoin, Geo. W.	Wilmington
Bowers, M. A.	Winston-Salem
Bowles, Francis N.	Durham
*Bowman, E. L.	McDonalds
Bowman, H. E.	Aberdeen
Bowman, H. P.	Greensboro
*Bown, Herbert H.	Asheville
Boyden, W. C.	China Grove
Boyette, E. C.	Charlotte
Boyles, A. C.	Troy
Boyles, J. H.	Greensboro
Boyles, M. F.	Dallas
Brackett, W. E.	Henderson
Brackin, H. B.	Raleigh
Braddy, Wade H.	Greensboro
Bradford, B. M.	Lincolnton
Bradshaw, T. G.	Wilson
Brantley, Hassell	Spring Hope
Brantley, J. C.	Spring Hope
Braswell, Wm. Edgar	Marshallberg
Brawley, M. H.	Salisbury
Brawley, Robt. V.	Salisbury
Bray, T. L.	Plymouth
*Brenizer, A. G., Jr.	Charlotte
*Brewer, J. S.	Roseboro
*Bridger, D. H.	Bladenboro
Briggs, H. H.	Asheville
Brinkley, H. M.	West Durham
Bristow, C. O.	Rockingham
Britt, C. S.	Charlotte
Britt, J. N.	Lumberton
*Britt, T. C.	Beaufort
Brittle, Paul C.	Burlington
*Broadway, R. E.	Southport
*Brockmann, Harry L.	High Point
*Brooks, B. U.	Durham
Brooks, G. M.	Elm City
Brooks, H. E.	Clayton
Brooks, R. E.	Burlington
Brookshire, H. G.	Asheville
*Broun, Matthew S.	Asheville
Brown, Clarence E.	Faith
Brown, E. M.	Washington

Name	Address
Brown, G. A.	Mt. Ulla
Brown, G. W.	Raeford
*Brown, J. P.	Fairmont
Brown, J. S. (Hon.)	Hendersonville
Brownson, Wm. C. (Hon.)	Asheville
*Bryan, Lorenzo D.	Snead's Ferry
Bryant, Chas. G.	Jonesville
Buchanan, C. L.	Union Mills
Buchanan, E. J.	Lexington
Buchanan, L. T.	Laurinburg
*Buchanan, S. E.	Concord
Buffaloe, J. S.	Garner
Bugg, C. R.	Raleigh
*Buie, Roderick M.	Greensboro
*Bulla, A. C.	Raleigh
Bulla, M. S.	Elizabeth City
Bullard, G. F.	Elizabethtown
Bullitt, J. B.	Chapel Hill
Bullock, Thos. C.	Autryville
Bullock, W. B.	Oxford
Bulluck, Ernest S.	Wilmington
Bunn, J. J.	Mt. Pleasant
Burleson, W. B.	Plumtree
Burleyson, L. N.	Concord
Burnett, Isaac E.	Mars Hill
Burress, D. A.	High Point
*Burrus, John T.	High Point
Burt, B. W.	Holly Springs
*Burt, S. P.	Louisburg
Busby, Julian G.	Salisbury
Butler, Leroy J.	Winston-Salem
Butt, R. B.	Marion
Butt, Virgil R.	Bakersville
Byerly, Andrew B.	Cooleemee
Byerly, Wesley Grimes	Sanatorium
Bynum, C. M.	Marshville
Bynum, John (Hon.)	Winston-Salem
Caldwell, D. G.	Concord
Caldwell, J. H.	Charlotte
*Campbell, Alton C.	Raleigh
Campbell, A. S.	Durham
Campbell, Jas. I.	Norwood
Campbell, J. W.	Gastonia
Candler, Chas. Z.	Sylva
Cannady, Sam H.	Oxford
*Carlton, R. L.	Winston-Salem
*Carmichael, T. W.	Rowland
*Carr, Ransom Lee	Rose Hill
*Carrington, G. L.	Durham
Carroll, E. D. Dixon	Raleigh
Carroll, John L.	Asheville
Carroll, John W.	Wallace
*Carter, H. W.	Washington
Carter, P. C.	Madison
*Casteen, Kenan	Leaksville
Castelloe, Cola	Windsor
*Cater, C. D.	Greensboro
Cathell, J. E.	Moncure
Caton, Geo. A.	New Bern
Cauble, H. H.	Kannapolis
Caveness, R. L.	Coleridge
Caveness, Zebulon M.	Raleigh
*Caviness, V. S.	Raleigh
Chambers, P. P.	Asheville
Chapin, S. C.	Columbia
Cheatham, Goode	Henderson
*Cheek, C. E.	Fuquay Springs
Cheesborough, Thos. P.	Asheville
Chester, P. J.	Fayetteville
Choate, Glenn Wm.	Salisbury
Choate, J. W.	Salisbury
Clark, D. D.	Clarkton
*Clark, E. S.	Clarkton
Clark, H. S.	Asheville
Clement, Edward B.	Salisbury
Cliff, B. F.	Hendersonville
Clinton, Roland S.	Gastonia
Clodfelter, C. M.	Lexington
Clyatt, Claude Eugene	Denton
*Cobb, Donald	Goldsboro
*Cobb, Wm. H., Jr.	Goldsboro
Coburn, Major H. C., Jr.	Fort Bragg
Cochran, J. D.	Newton
*Cocke, C. H.	Asheville
Cocke, E. R.	Asheville
Cocke, Jere E.	Asheville
*Codington, H. A.	Wilmington
Coe, Samuel S.	High Point
Coffey, Lawrence H., 911 E. Main St., Lakeland, Fla.	(Caldwell Co.)
Colby, C. DeW.	Asheville
Cole, Walter F.	Greensboro
*Coleman, G. S.	Kenly
*Collins, George	Raleigh (Mecklenburg Co.)
Combs, Howard J.	Elizabeth City
Cooke, H. L.	Fayetteville
*Cooke, G. C.	Winston-Salem

Name	Address
*Cooper, G. M.	Raleigh
Coppedge, T. O.	Nashville
*Coppridge, W. M.	Durham
*Corbett, L. W.	Goldsboro
Corpening, O. J.	Granite Falls
Costner, Thos. F.	Lumberton
Cotton, Clyde E.	Asheville
Couch, V. F.	Winston-Salem
Council, J. B. (Hon.)	Salisbury
Covington, Platt W.	Wadesboro
Cowell, Will H.	Shawboro
Cox, Benj. F.	Palmerville
Cox, B. T.	Winterville
*Cox, E. L. (Hon.)	Jacksonville
Cox, G. S.	Tabor
Cox, Thomas A.	Hertford
Cozart, S. R.	Greensboro
*Cozart, W. S.	Fuquay Springs
Craddock, A. B.	Asheville
Craig, S. Douglas	Winston-Salem
*Cranmer, J. B.	Wilmington
Craven, F. C.	N. Wilkesboro
Craven, Thomas	Huntersville
*Craven, W. W.	Charlotte
Crawford, Robt. H.	Rutherfordton
Crawford, W. J.	Goldsboro
Crawford, W. B.	Goldsboro
*Crews, N. H.	Greensboro
Crisp, S. M.	Harrellsville
*Cromartie, R. S.	Garland
Crouch, A. McR.	Wilmington
Crouch, T. D.	Stony Point
*Crowell, A. J. (Hon.)	Charlotte
Crowell, L. A.	Lincolnton
Crowell, W. H.	Whiteville
*Crumpler, Paul	Clinton
Cummings, M. P.	Reidsville
Currie, D. S.	Parkton
*Cutchin, J. Henry	Whitakers
Daligny, Charles (Hon.)	Troy
Dalton, David N. (Hon.)	Win.-Salem
Dalton, Wm. N.	Winston-Salem
Dameron, Ernest L.	Star
*Daniel, N. C.	Oxford
*Daniels, O. C.	Oriental
*Daniels, R. L.	New Bern
Darden, D. B.	Stantonsburg
Darden, O. B.	Richmond, Va. (Durham-Orange Co.)
Daughtridge, A. L.	Rocky Mount
Daugherty, J. E.	Brooklyn, N. Y. (Forsyth Co.)
Davenport, C. A.	Hertford
*Davidson, Jno. E. S.	Charlotte
*Davis, F. M.	Canton
Davis, George	Beaufort
Davis, Jas. W.	Statesville
Davis, J. F.	High Falls
Davis, J. J.	Marshallberg
Davis, J. M.	Wadesboro
*Davis, R. B.	Greensboro
Davis, Thomas W.	Winston-Salem
Davis, W. C.	Summerfield
*Dawson, Walter W.	Grifton
*Dawson, W. E.	Hookerton
Deans, A. W.	Battleboro
DeArmon, J. McC. (Hon.)	Charlotte
Dees, D. A.	Bayboro
*Dees, R. E.	Greensboro
Dees, Rigdon O.	Greensboro
DeLaney, Chas. O.	Winston-Salem
Denchfield, A. L.	Asheville
Denson, H. A.	Bennett
Denton, A. L.	Castalia
*Dewar, Wm. B.	Raleigh
Dick, Julius V.	Gibsonville
*Dickie, J. W.	Southern Pines
Dickinson, E. T.	Greenville
Dicks, Jas. Franklin	Stoneville
Dillard, G. P.	Draper
Dillard, Richard, Jr. (Hon.)	Edenton
*Dixon, G. G.	Ayden
*Dixon, Guy E.	Hendersonville
Dixon, Hubert C.	Madison
Dixon, Joseph	Greenville
*Dixon, W. H.	Rocky Mount
*Dixon, Wm. H.	Kinston
Dodson, H. H. (Hon.)	Greensboro
Donnelly, J.	Charlotte
Drafts, Andrew B.	Hendersonville
Duffy, Leinster	New Bern
Duffy, R. N.	New Bern
Duggins, Maj. P. E.	Ft. Bragg
Duguid, James	Vanceboro
Duncan, Amos C.	Forest City
Duncan, Julian E.	N. Wilkesboro

Name	Address
*Duncan, S. A.	Coats
Dunlap, L. V.	Albemarle
Dunn, Wm. L.	Asheville
Dyer, John W.	High Point
Eagle, J. C.	Spencer
Eagles, Chas. S.	Saratoga
Easley, P. S.	Statesville
Eckel, O. F.	Asheville
Eddleman, Hall M.	Gastonia
*Edgerton, Jas. L.(Hon.)	Hendersonville
Edwards, A. D.	Winston-Salem
Edwards, B. O.	Asheville
Edwards, C. J.	Raleigh
Edwards, C. P.	Asheville
Edwards, F. D.	Toluca
Edwards, G. C.	Hookerton
*Edwards, J. D. (Hon.)	Siler City
Edwards, V. E.	Greensboro
Elias, Lewis W.	Asheville
*Ellen, C. J.	Greenville
Eller, Albert J.	Readybranch
Ellington, A. J.	Burlington
Elliott, A. H.	Wilmington
Elliott, J. A.	Charlotte
*Elliott, W. F.	Lincolnton
Ellis, F. A.	Salisbury
Ellis, R. C. (Hon.)	Shelby
English, Edwin S.	Brevard
English, I. L.	Faust
Erwin, Evan A.	Laurinburg
*Evans, J. E.	Wilmington
*Evans, L. B.	Windsor
*Evans, W. E.	Rowland
*Everett, A. C.	Rockingham
Ezzell, S. H.	Waxhaw
Faison, I. W. (Hon.)	Charlotte
*Faison, W. W. (Hon.)	Goldsboro
Faison, Yates W.	Charlotte
Farrar, M. R.	Pleasant Garden
Farrior, J. W.	Warsaw
*Farthing, L. E.	Wilmington
Fassett, Burton W.	Durham
Fearing, Isaiah	Elizabeth City
Fearing, Zenas, Jr.	Elizabeth City
Fearrington, Jos. P.	Winston-Salem
*Felts, Robt. L.	Durham
Fenner, Edwin F.	Henderson
Ferebee, C. G.	Morehead City
*Ferguson, R. T.	Charlotte
Fetner, L. M.	Charlotte
Fetzer, P. W.	Madison
*Finch, O. E.	Raleigh
*Fitzgerald, J. H.	Smithfield
Flagge, Philip W.	Jamestown
Fleetwood, Joe E.	Conway
*Fleming, M. I.	Rocky Mount
Fleming, W. L.	Enfield
Flemming, G. M.	Cleveland
Flippin, J. M.	Hickory
Flippin, Samuel T.	Siloam
Flowe, R. Frank	Kannapolis
Flowers, C. E.	Zebulon
Flowers, Clarence A.	Wendell
Flowers, G. E.	Hickory
Floyd, L. D.	Cerro Gordo
Flynt, S. S.	Rural Hall
Foard, F. T.	Hickory
*Foley, C. E.	Raleigh
Folsom, T. W.	Asheville
*Ford, D. E.	New Bern
*Formyduval, T.	Bolton
Fortune, Alex. F.	Greensboro
Foster, H. H.	Norlina
Foster, J. F.	Sanford
Fouts, J. H.	Franklin
Fowler, M. L.	Zebulon
Fox, N. A.	Guilford College
Francis, Wm. G.	Waynesville
Frazer, H. Thompson	Asheville
*Freeman, J. D.	Wilmington
Freeman, R. H.	Raleigh
Frink, H. W.	Southern Pines
*Frizzelle, M. T.	Ayden
Frye, Glenn R.	Hickory
Furman, Wm. H.	Henderson
Futrell, L. M.	Murfreesboro
*Futrell, W. E.	Lasker
Gage, L. G.	Charlotte
*Gainey, John W.	Fayetteville
Gallant, Robt. M.	Charlotte
*Galloway, W. C. (Hon.)	Wilmington
Gamble, J. F.	Lincolnton
Gamble, J. R.	Lincolnton
Gambrell, Grover C.	Lexington

Name	Address
Garren, R. H.	Monroe
Garrenton, Cecil	Bethel
Garrett, F. B.	Rockingham
*Garrett, F. J.	Rockingham
Garrison, D. A.	Gastonia
*Garriss, F. H.	Lewiston
Garvey, R. R.	Elkin
Gary, R. H.	Murfreesboro
Gaskin, Lewis R.	Albemarle
Gaul, Jno. Stuart	Charlotte
Gaw, L. B.	Greensboro
Geddie, K. B.	Raeford
*Gentry, Geo. W.	Roxboro
Gibbon, James	Charlotte
Gibbon, Robert L. (Hon.)	Charlotte
Gibbs, E. W.	Shelby
*Gibbs, J. B.	Burnsville
Gibbs, N. M.	New Bern
Gibson, John S.	Gibson
*Gibson, M. R.	Raleigh
Gill, Robert J.	Henderson
Gilreath, F. H.	North Wilkesboro
Gilmer, Chas. S. (Hon.)	Greensboro, Rt. 6
Gilmore, C. M.	Greensboro
Gilmore, W. D.	Fort Wayne, Ind. (Iredell-Alexander Co.)
Ginn, Theo. L.	Goldsboro
Glascock, J. H.	Greensboro
Glenn, Henry F.	Gastonia
*Glenn, Lucius N.	Gastonia
Godwin, G. C.	Oteen
Gold, Ben	Shelby
Gold, Chas. F.	Ellenboro
Gold, T. B.	Lawndale
Goley, Willard Coe	Graham
Goley, Wm. Rankin (Hon.)	Graham
Goley, Wm. R.	Shallotte
Goode, T. V.	Statesville
Goodman, A. B.	Lenoir
Goodwin, A. W. (Hon.)	Raleigh
*Goodwin, O. S.	Raleigh
Goudelock, Jno. J.	Monroe
Gouge, A. E.	Bakersville
Gouger, Geo. J.	Concord
Gove, Anna M. (Hon.)	Greensboro
*Grady, Jas. C. (Hon.)	Kenly
Grady, Leland V.	Wilson, Rt. 2
Grady, Wm. Earle	Tryon
*Graham, Benj. R.	Wilmington
Graham, J. A.	Kansas City (Guilford Co.)
Graham, Joseph	Durham
Graham, Wm. A. (Hon.)	Charlotte
Grantham, Wm. L.	Asheville
Gray, Eugene P.	Winston-Salem
*Grayson, C. S.	High Point
*Green, Thos. M.	Wilmington
*Green, Wm. W.	Tarboro
Greene, Jos. B.	Asheville
Greenwood, A. B.	Asheville
Greenwood, S. E.	Fletcher
Grier, Chas. T.	Carthage
Griffin, J. A. (Hon.)	Clayton
*Griffin, M. A.	Asheville
Griffin, Thos. A.	Wendell
Griffin, W. R.	Asheville
Griffith, F. W.	Asheville
Griffith, L. M.	Asheville
Griggs, John B.	Elizabeth City
Griggs, W. T.	Poplar Branch
Grimes, W. L.	Winston-Salem
*Groves, R. B.	Lowell
Gwyn, H. L.	Yanceyville
Gyles, Ronald C.	Siler City
*Hackney, Ben H.	Lucama
Hagaman, J. B.	Todd
*Halford, Jos. W.	Lillington
Hall, James S.	Wilmington
*Hall, J. Clegg	Albemarle
Halsey, Benj. F. (Hon.)	Roper
Hambrick, Robt. T.	Hickory
Hamilton, John H.	Wilmington
*Hammond, A. F.	Pollocksville
Hamrick, J. Y., Jr.	Boiling Springs
Hamrick, T. G.	Shelby
Hand, Edgar H.	Charlotte
Hanes, F. M.	Winston-Salem
Hanes, J. L.	Pine Hall
Harbison, J. W.	Shelby
Hardee, Parrott R.	Stem
Hardee, W. P.	Durham
Harden, Graham	Burlington
*Harden, R. N.	Greensboro
*Hardin, E. R.	Lumberton
Hardin, R. H.	Banner Elk

Name	Address
Hardy, Ira M.	Kinston
Harper, J. H.	Snow Hill
Harper, J. M.	Aurora
Harper, W. T.	Southern Pines
Harrell, Geo. N.	Murfreesboro
Harrell, S. N.	Tarboro
Harrill, L. B.	Caroleen
Harrington, Carey L.	East Laporte
Harris, Arthur G.	Fairfield
*Harris, F. R. (Hon.)	Henderson
Harrison, Edmund	Greensboro
Harrison, H. H.	Asheville
*Harriss, Andrew H. (Hon.)	Wilmington
Hart, Jno. E.	Wadesboro
Hart, V. K.	Statesville
Hartsell, F. E.	Oakboro
Hartsell, J. A.	Concord
Hatcher, M. A.	Hamlet
Hathcock, Thos. A.	Norwood
Harvey, W. W.	Greensboro
Hayes, R. B.	Hillsboro
Hays, A. H.	Fairmont
Hays, B. K. (Hon.)	Ft. Lyon, Colo. (Granville Co.)
Haywood, Hubert (Hon.)	Raleigh
*Haywood, Hubert B., Jr.	Raleigh
*Hayworth, C. A.	Asheboro
Head, W. T.	Campobello, S. C., Rt. 4 (Rutherford Co.)
Hedrick, C. R.	Lenoir
*Hege, J. Roy	Winston-Salem
Heilig, Herman G.	Salisbury
Helms, T. L.	Randleman
Helsabeck, C. J.	Walnut Cove
Helsabeck, R. S.	Mizpah
*Hemmingway, J. D.	Bethel
Henderson, C. C.	Mount Olive
Henderson, Jno. P.	Jacksonville
*Henderson, R. B.	Franklinton
*Henderson, S. McD.	Charlotte
Henderson, T. B.	Goldsboro
Henry, T. B.	Rockingham
Herbert, Fred L.	Andrews
Herbert, Wm. P.	Asheville
Herman, Chas. B.	Statesville
*Herring, Benj. S.	Wilson
Herring, R. A.	Greensboro
*Hester, Jos. R.	Knightdale
Hiatt, H. B.	High Point
Hickman, M. T.	Hudson
Hicks, Calvin S.	Durham
Hicks, I. F.	Dunn
Hicks, Romeo	Henrietta
*Hicks, V. M.	Raleigh
Higgins, L. M.	Salisbury
*Highsmith, J. D.	Fayetteville
Highsmith, J. F. (Hon.)	Fayetteville
Highsmith, Seavy	Fayetteville
Highway, S. C.	Murphy
Hill, J. N.	Murphy
Hill, W. Lee	Lexington, Rt. 4
Hill, Wm. I.	Albemarle
*Hines, E. R.	Rocky Mount
Hinnant, Milford	Micro
Hipp, Edw. R.	Charlotte
Hipps, A. G. T.	Asheville
Hobgood, J. E.	Thomasville
*Hocutt, Battle A.	Clayton
Hodge, A. R.	Severn
Hodges, Jos. M.	Boone
*Hodgin, H. H.	Red Springs
*Hoggard, J. T.	Wilmington
Hoggard, Wm. A.	Hertford, Rt. 3
*Holden, E. C.	High Point
Hollingsworth, E. M.	Mount Airy
*Hollingsworth, E. T.	Clinton
Holloway, O. W.	Durham
Holloway, Robt. L.	W. Durham
Hollyday, W. M.	Asheville
*Holmes, A. B.	Fairmont
*Holt, D. W.	Greensboro
Holt, E. E.	Southern Pines
Holt, T. J.	Warrenton
*Holt, Wm. P.	Erwin
Holt, Wm. T.	McLeansville
Holton, Thos. J.	Charlotte
Honnett, Joseph H.	Wilmington
Hood, J. Sidney	Gastonia
Hooker, John S.	Farmville
*Hooks, Thel	Smithfield
Hooper, D. D.	Sylva
*Hooper, Jos. W.	Wilmington
Hoover, C. H.	Crouse
Hoover, H. R.	Wilson
Hord, J. G.	Kings Mountain
Horsley, H. T.	Franklin
Horton, M. C.	Raleigh

Name	*Address*
*Horton, W. C.	Raleigh
Houck, Albert F. (Hon.)	Lenoir
*Houser, E. A.	Shelby
Houser, O. J.	Charlotte
*Houser, W. H.	Cherryville
Hovis, L. W.	Charlotte
Howard, J. R.	Bonlee
Howe, Wm. B. W., Jr.	Hendersonville
Howell, W. L.	Ellerbe
Hoyle, Hughes B.	Manteo
Hubbard, Chas. C.	Farmer
Hubbard, Fred C.	North Wilkesboro (Member Iredell-Alexander)
*Hudson, C. C.	Greensboro
*Huffines, T. R.	Asheville
*Hunnicutt, Wm. J.	Asheville
Hunt, J. F.	Spindale
Hunt, W. Bryce	Lexington
Hunter, J. V.	Asheboro
Hunter, L. W. (Hon.)	Charlotte, Rt.1
Hunter, M. C.	Huntersville
Hunter, Myers	Charlotte
Hunter, Norman C.	Durham
Hunter, W. B.	Cramerton
Hurdle, S. W.	Winston-Salem
Huston, Jno. W.	Asheville
Hutchins, E. M.	North Wilkesboro
Hutchinson, S. S.	Bladenboro
*Hyatt, A. L.	Kinston
Hyatt, Fred C.	Greensboro
Hyde, Francis E.	Beaufort
Ingram, Chas. B. (Hon.)	Mt. Gilead
Irwin, Hamner C.	Pocatella, Idaho (Mecklenburg Co.)
Irwin, Henderson	Goldsboro
Irwin, J. R. (Hon.)	Charlotte
*Ivey, H. B.	Goldsboro
Ivey, R. R., U.S.P.H.S.	Biltmore
Izlar, H. L.	Winston-Salem
Jackson, C. C.	Yeatesville
Jackson, Walter L.	High Point
Jacocks, W. P.	New York City (Lincoln County)
James, Albert W.	Hamlet
James, F. P.	Laurinburg
*James, W. D.	Hamlet
Jarboe, Parran	Greensboro
Jarman, F. G.	Roanoke Rapids
Jenkins, Chas. L. (Hon.)	Raleigh
Jennings, C. W.	Greensboro
Jennings, R. G.	Thomasville
Jervey, A. J.	Tryon
Jett, Samuel G.	Reidsville
Jewett, R. D. (Hon.)	Wilmington
John, Peter	Laurinburg
Johnson, B. C.	Bunn
Johnson, C. T.	Red Springs
Johnson, Floyd	Whiteville
*Johnson, Geo. W.	Wilmington
*Johnson, Harry H.	Louisburg
Johnson, John B.	Old Fort
Johnson, N. M. (Hon.)	Durham
Johnson, R. Lee	Gastonia
Johnson, Thos. C.	Lumberton
Johnson, W. A.,	Reidsville, R. F. D.
Johnson, W. C.	Canton
Johnson, W. M.	Winston-Salem
*Johnston, J. G.	Charlotte
Johnston, W. W.	Manteo
*Jonas, John F.	Marion
Jones, A. G. (Hon.)	Walnut Cove
Jones, Arthur O.	Greensboro
Jones, Beverly N.	Winston-Salem
Jones, R. Duval	New Bern
*Jones, R. Rives	Winston-Salem
Jones, Thomas J.	Lansing
Jones, T. Lester	Lansing
Jones, Wm. M.	Greensboro
Jordan, Chas. S.	Asheville
Jordan, T. M. (Hon.)	Raleigh
*Jordan, Wm. S.	Fayetteville
*Judd, Eugene C.	Raleigh
Judd, James M.	Varina
Julian, Chas. A. (Hon.)	Thomasville
Jurney, Peter Claywell	Turnersburg
*Justis, L. H.	Littleton
Justice, Z. K.	Davidson
Kafer, Oswald O.	Edward
Kapp, Henry H.	Winston-Salem
Keiger, Jas. A.	Greensboro
Keiger, O. R.	Winston-Salem
Kendrick, R. L.	Elizabeth City
*Kennedy, Geo. W.	Beulaville
*Kennedy, John P.	Charlotte
*Kent, Alfred A.	Winter Park, Fla.

Name	*Address*
	(Caldwell Co.)
Kernodle, Chas. E.	Elon College
*Kerns, T. C.	Durham
*Kerr, Jas. E.	Winston-Salem
Kerr, John D.	Clinton
Ketchie, J. M.	Salisbury
Kibler, W. H.	Morganton
Killian, P. B.	Hayesville
King, Edward	Asheville
*King, Parks M.	Charlotte
King, Richard M.	Concord
Kinlaw, W. B.	Rocky Mount
*Kinsman, Henry F.	Hamlet
Kirby, Guy S.	Marion
Kirk, W. R.	Hendersonville
Kirkpatrick, W. L.	Waynesville
*Kirksey, James J.	Morganton
Kiser, W. C.	Lincolnton
*Kitchin, Thurman D.	Wake Forest
Klutz, A. F.	Maiden
*Knight, Floyd L.	Sanford
*Knight, Wm. P.	Greensboro
Knoefel, A. E.	Black Mountain
*Knowles, D. L.	Rocky Mount
Knox, A. W. (Hon.)	Raleigh
Knox, John, Jr.	Lumberton
*Koonce, S. Everett	Wilmington
Kornegay, Lemuel W.	Rocky Mount
Kutscher, G. W., Jr.	Swannanoa
Lackey, F. H.	Fallston
Lafferty, Robt. H.	Charlotte
Lambert, C. F.	Spruce Pine
Lambert, W. L.	Asheboro
Lamm, Isaac W.	Lucama
Lancaster, F. J.	Lexington
Landen, J. F.	Chinquapin
Lane, Bessie	Raleigh
*Lane, John L.	Rocky Mount
Lane, M. E.	Pinetops
Lane, P. P.	Wilson
Lapham, Mary E.	Highlands
Large, H. Lee	Rocky Mount
Lassiter, C. L.	Fremont
Lassiter, H. G.	Weldon
*Latham, Jos. R.	New Bern
Laton, Jas. F.	Albemarle
Lattimore, E. B.	Shelby
*Laughinghouse, Chas. O'H.	(Hon.) Greenville
*Lawrence, B. J.	Raleigh
*Lawrence, Chas. S.	Winston-Salem
Lawson, R. B.	Chapel Hill
Lea, J. I.	Tryon
Leak, Wharton G.	East Bend
Ledbetter, Jas. McQ.	Rockingham
*Lee, J. Marshall	Newton Grove
Lee, Lawrence V.	Lattimore
Lee, R. E.	Lincolnton
*Lee, S. E.	Sanatorium
Leeper, Donald H.	Hiddenite
*Leinbach, Robt. F.	Charlotte
Lentz, C. M.	Albemarle
Lewis, Geo. W. (Hon.)	Wilson
Lewis, H. W. (Hon.)	Jackson
Lewis, Richard H. (Hon.)	Raleigh
Lewis, S. V.	Greensboro
*Liles, N. P.	Lilesville
Lilly, Jas. M.	Fayetteville
*Linville, A. Y. (Hon.)	Winston-Salem
*Linville, W. C.	Goldsboro
Lister, E. W.	Weeksville
Lister, J. L.	Jackson
Little, E. E.	Statesville
*Livingston, E. A.	Gibson
Lloyd, B. B.	Chapel Hill
*Locke, Eva M.	White Rock
*Lockett, Everett A.	Winston-Salem
Logan, F. W. F.	Rutherfordton
*Long, Benj. Leroy	Glen Alpine
Long, Edgar M.	Hamilton
Long, E. F.	Raleigh
Long, Fred Y.	Catawba
Long, Glenn	Newton
Long, H. F. (Hon.)	Statesville
Long, J. W. (Hon.)	Greensboro
Long, R. H.	Morganton
*Long, T. W. M.	Roanoke Rapids
*Long, V. McK.	Winston-Salem
Long, Walter T.	Roxboro
Looney, J. J. W.	Rocky Mount
Lord, Marjery J.	Black Mountain
*Love, Bedford E.	Roxboro
Love, Wm. M.	Monroe
Lovelace, Thos. C.	Henrietta
Lovill, Robt. J.	Mount Airy

Name	*Address*
Lowery, Jno. R.	Raleigh
Lubchenko, N. E.	Harrisburg
*Lutterloh, I. Hayden, Jr.	Sanford
Lutterloh, I. H., Sr.	Sanford
Lyday, Abram E.	Penrose
Lyday, C. E.	Gastonia
Lyday, Wm. Monroe	Brevard
Lyle, S. H.	Franklin
Lynch, J. M.	Asheville
Lyon, B. R.	Greensboro
Lyon, Henry Wise	Rocky Mount
*MacConnell, John W.	Davidson
*MacFadyen, Paul R.	Concord
*MacNider, Wm. deB.	Chapel Hill
MacPherson, G. S.	Asheville
MacRae, J. D.	Asheville
McAdams, C. R.	Belmont
McAnally, Wm. J.	High Point
McAndrew, P. H.	Ft. Bragg
*McBrayer, L. B.	Southern Pines
*McBrayer, R.	Shelby
McBryde, M. H.	Reidsville
*McCain, P. P.	Sanatorium
McCain, Wm. R.	High Point
McCall, A. C.	Asheville
McCampbell, John	Morganton
McClees, E. C.	Elm City
McClelland, J. O.	Maxton
McCombs, C. J.	Gastonia
*McCotter, St. Elmo	Bayboro
McCracken, C. M.	Fairview
*McCracken, J. R.	Waynesville
*McCreary, A. B.	Rockingham
McCuiston, A. M.	Raleigh
McCutcheon, W. B.	Durham
McDade, B. B.	Corbett, Rt. 1
McDaniel, L. E.	Lasker
McDonald, A. A.	Jackson Springs
McDowell, F. C.	Zebulon
McDuffie, W. N.	Hemp
McElwee, Ross S.	Statesville
McFadyen, O. L.	Fayetteville
*McGeachy, R. S. (Hon.)	Kinston
McGee, Jas. W. (Hon.)	Raleigh
McGehee, Jno. Wm.	Reidsville
McGoogan, Benj. J.	McFarlan
McGougan, J. V.	Fayetteville
McGowan, Claudius	Plymouth
McIntosh, D. M.	Old Fort
McIntosh, W. R.	Rockingham
*McIver, Lynn	Sanford
McKay, H. W.	Charlotte
*McKay, Jos. F.	Buies Creek
*McKay, W. P.	Fayetteville
McKenzie, B. W.	Salisbury
*McKenzie, Wm. W. (Hon.)	Salisbury
McLaughlin, C. S.	Charlotte
McLaughlin, J. E. (Hon.)	Statesville
McLean, Allen	Wagram
McLean, John W.	Godwin
McLean, Peter	Laurinburg
McLelland, W. D.	Mooresville
McLemore, Geo. A.	Smithfield
McLeod, A. H.	Aberdeen
McManus, H. F.	Matthews
McManus, W. L.	Greensboro
McMillan, B. F. (Hon.)	Red Springs
*McMillan, E. G.	Maxton
McMillan, J. M.	Candor
*McMillan, R. D.	Red Springs
McMillan, W. D. (Hon.)	Wilmington
McNairy, Caroline	Lenoir
McNairy, C. Banks	Lenoir
McNeill, Jas. W. (Hon.)	Fayetteville
McPhail, L. D.	Charlotte
*McPhaul, W. A.	Charlotte
*McPherson, C. W.	Burlington
McPherson, R. G.	Saxapahaw
McPherson, S. D.	Durham
*Macon, G. H.	Warrenton
Mahoney, A. F.	Monroe
*Mallett, E. P.	Hendersonville
Malone, J. Y.	Asheville
Malone, James E.	Louisburg
Malloy, S. A.	Yanceyville
Maness, J. M.	Ellerbe
*Mangum, C. P.	Kinston
Mangum, C. S.	Durham
Mann, I. Thurman	High Point
Mann, S. M.	Moyock
*Manning, I. H.	Chapel Hill
Manning, John M. (Hon.)	Durham
Mariner, N. B.	Belhaven
Markham, Blackwell	Durham
Marlowe, W. H.	Wilson
Marr, M. W.	Pinehurst
Marsh, Frank B.	Salisbury
*Martin, J. A.	Lumberton

Name	*Address*
Martin, J. F.	Dunn
Martin, J. H.	Red Oak
Martin, J. W.	Roanoke Rapids
*Martin, Lester P.	Mocksville
*Martin, Moir S.	Mt. Airy
Martin, Sydnor L.	Leaksville
Martin, W. C.	Mocksville
Martin, Wm. F.	Charlotte
Martin, W. J.	Davidson
Mason, Manly	Newport
*Massey, C. C.	Smithfield
Matheson, Jas. P.	Charlotte
Mathews, Vann M.	Charlotte
Mathews, W. S.	Bessemer City
Matthews, Jas. O.	Clinton, R. F. D.
*Matthews, M. L.	Sanford
Matthews, Wm. W.	Spray
Maxwell, C. S.	Beaufort
*Maxwell, H. B.	Whiteville
*Maxwell, J. F.	Pink Hill
Mayerberg, I. W.	Selma
Maynard, J. D.	Wadesboro
*Meadows, W. J.	Greensboro
*Mebane, W. C.	Wilmington
Melvin, W. C.	Linden
Menzies, H. C.	Hickory
Menzies, H. H.	Hickory
Meriwether, B. M.	Asheville
Merritt, John H.	Woodsdale, R. 1
*Michaux, Edward R.	Greensboro
Miles, May S.	Greensboro
Millander, C. W.	Asheville
*Miller, J. F.	Marion
*Miller, Oscar L.	Gastonia
*Miller, R. C.	Gastonia
Miller, Robert B.	Goldsboro
Milliken, J. S.	Southern Pines
Mills, C. H. C.	Charlotte
Mimms, C. W.	Winston-Salem
Minor, Charles L.	Asheville
*Misenheimer, C. A. (Hon.)	Charlotte
Mitchell, Geo. W.	Wilson
Mitchell, Jesse H.	Ahoskie
Mitchell, Paul H.	Ahoskie
Mitchell, R. C.	Mt. Airy
Mitchell, W. F.	Shelby
*Mitchell, Z. P.	Weldon
*Mitchener, J. S.	Raleigh
*Mock, Frank L.	Lexington, R. 3
Monk, Henry L.	Salisbury
*Monroe, J. P.	Sanford
Montague, S. J.	Durham
Montgomery, Harry M.	Burlington
Montgomery, John C. (Hon.)	Charlotte
Montgomery, K. E.	Miami, Fla. (Haywood Co.)
Moore, Alexander W.	Charlotte
Moore, D. B.	Mt. Holly
Moore, Chas. E. (Hon.)	Wilson
Moore, Chas. Edward	Greensboro
Moore, D. B.	Badin
*Moore, Edwin G. (Hon.)	Elm City
Moore, Henry B.	Morven
Moore, Jos. N.	Marshall
*Moore, Julian A.	Wilmington
Moore, K. C.	Wilson
Moore, Oren	Charlotte
Moore, R. A.	Gastonia
Moore, R. A.	Winston-Salem
*Moore, T. V.	Acme
*Moore, W. Houston	Wilmington
Moore, Wm. James	Ashboro
Morgan, B. E.	Asheville
*Morgan, G. A.	Asheville
Morrill, D. S.	Farmville
Morrill, Jenness	Falkland
*Morris, Carlyle	Maxton
Morris, G. Dillon	Goldsboro
Morris, Geo. B.	Goldsboro
Morris, Jos. A.	Oxford
Morrow, Wm. C.	Andrews
Morton, J. X.	Faison
Moseley, Chas. W.	Greensboro
Moseley, Z. V.	Kinston
Mudgett, W. C.	Southern Pines
Munroe, H. Stokes	Charlotte
Munroe, J. P. (Hon.)	Charlotte
Munt, H. F.	Winston-Salem
*Murchison, D. R.	Wilmington
*Murphy, D. P.	Rutherfordton
Murphy, John G.	Wilmington
*Murphy, W. B.	Snow Hill
Murray, R. L.	Raeford
*Myers, Alonzo	Charlotte
*Myers, John Q.	Charlotte
Myers, R. W.	Fullers, Rt. 1
*Nalle, B. C.	Charlotte

Name	*Address*
Nance, C. L.	Charlotte
*Nash, J. Fred	St. Paul
Neal, John W.	Monroe
Neal, Kemp P.	Raleigh
*Neal, Paul N.	Raleigh
Nelson, R. J. (Hon.)	Robersonville
*Nesbitt, Charles T.	Wilmington
Newbern, J. M.	Jarvisburg
Newby, G. E.	Hertford
Newcombe, A. P., Jr.	Henderson
*Newell, H. A.	Henderson
Newell, J. O.	Louisburg
Newell, Leone B.	Charlotte
Newman, Harold H.	Salisbury
*Newton, Howard L.	Charlotte
Nichols, Alvin A.	Sylva
Nichols, Asbury S.	Sylva
Nichols, Austin F.	Roxboro
Nichols, Rhodes E.	Durham, Rt. 8
Nicholson, B. M.	Enfield
Nicholson, N. G.	Mt. Gilead
Nicholson, J. L.	Washington
Nicholson, P. A. (Hon.)	Washington
Nicholson, S. T. (Hon.)	Washington
*Nisbet, D. Heath	Charlotte
Nisbet, Walter O.	Charlotte
Noble, R. J. (Hon.)	Selma
*Noble, R. P.	Raleigh
*Nobles, Jos. E.	Greenville
Noblin, Roy L.	Stovall
Noell, R. H.	Rocky Mount
Nolan, J. V.	Kannapolis
Norburn, C. S.	Asheville
*Norfleet, E. P.	Roxobel
Norfleet, L. E.	Tarboro
Norman, J. S.	Columbia
Norris, Henry	Rutherfordton
*Northington, J. M.	Charlotte
Nowell, S. C.	Hickory
Oates, George	Grover
Oates, W. C.	Belmont
O'Briant, A. L.	Cameron
Ogburn, H. H.	Greensboro
Olive, P. W.	Fayetteville
Oliver, A. S.	Benson
Orr, Chas. C.	Asheville
Orr, P. B.	Asheville
*Orr, W. J. B.	Smithfield
*Outland, C. L.	Greenville
*Pace, K. B.	Greenville
Packard, F. S.	Norlina
Packard, G. H.	Meredith, N. H. (Madison Co.)
Paddison, J. R.	Kernersville
*Page, B. W.	Maysville
Palmer, Horace	Littleton
Palmer, M. C.	Tryon
Parker, Clifton G.	Woodland
*Parker, C. P.	Seaboard
Parker, James R.	Clinton
Parker, G. E.	Benson
Parker, Geo. F.	Asheville
Parker, H. R.	Greensboro
*Parker, John Rainey	Burlington
*Parker, O. L.	Clinton
Parker, Paul G.	Erwin
Parker, S. F.	Mount Olive
Parker, Walter R.	Woodland
*Parrott, Albert DeK.	Kinston
*Parrott, Jas. M. (Hon.)	Kinston
Parrott, M. C.	Kinston
*Parrott, Wm. T.	Kinston
Parsons, W. H.	Ellerbe
Pate, F. J.	Greensboro
Pate, Jas. G.	Gibson
Patrick, Geo. R., Jr.	Bessemer City
Patrick, J. E.	Bahama
Patrick, L. N.	Gastonia
Patterson, Jno. A.	Concord
Patterson, Jos. F.	New Bern
Patterson, Reid	Charlotte
Patton, A. B.	Hendersonville
Payne, J. W.	E. Flat Rock
Payne, R. L.	Monroe
Pearson, Raymond	Monroe
Peck, Edward J.	Hot Springs
Peek, W. A.	Ramsaytown
Peeler, Clarence N.	Charlotte
Peeler, John H.	Salisbury
Peery, Vance P.	Kinston
Peete, C. H.	Warrenton
Pemberton, Wm. D. (Hon.)	Concord
Pendleton, Wilson	Asheville
*Pepper, Jno. Kerr	Winston-Salem
Perkins, David R.	Marshville
Perkins, Jno. R.	Winston-Salem

Name	Address
Perry, A. H.	Wood
Perry, D. R.	Durham
Perry, E. M.	Rocky Mount
Perry, H. B.	Valle Crucis
Perry, H. G.	Louisburg
Perry, Robt. E.	Greensboro
*Person, Edgar C.	Pikeville
Person, H. M.	Goldsboro
*Person, J. B.	Selma
Person, T. E.	Stantonsburg
Peters, W. A.	Elizabeth City
Peterson, C. A.	Spruce Pine
Peterson, J. M.	Spruce Pine
Peterson, W. C.	Wilmington
Petrie, Robt. Wm.	Charlotte
Petteway, Geo. H.	Charlotte
Pfohl, Samuel F.	Winston-Salem
Phifer, Edward M.	Morganton
Phillips, C. C.	Charlotte
Phillips, C. H.	Thomasville
Phillips, J. W.	Lillington
Pickett, John A.	Burlington, R.F.D. 1
Pittman, E. E.	Oak City
*Pittman, R. L.	Fayetteville
Pitts, W. I.	Lenoir
Plyler, R. J.	Salisbury
Pollard, W. B.	Winton
Pollard, Raymond	New Bern
Pool, B. B.	Winston-Salem
Poole, Claude T.	St. Pauls
*Pope, Henry T.	Lumberton
Post, J. J.	Greensboro
Poston, J. Lewis	Statesville
Powell, Albert H.	Durham
Powell, H. H.	Stantonsburg
Powell, Jesse A.	Edenton
Pressly, Geo. W. (Hon.)	Charlotte
Pressly, J. M.	Belmont
Price, H. L.	Fairmont
Primrose, R. S.	New Bern
Pritchard, A. T.	Asheville
Pritchard, G. L.	Black Mountain
Pritchard, Jno. L.	Windsor
Proffit, Thos. J.	Elk Park
*Procter, I. M.	Raleigh
Pruitt, G. C.	Monroe
Pugh, Chas. H.	Gastonia
Purdy, J. J.	Oriental
Purington, H. H.	Durham
Putney, R. H.	Elm City
Putney, W. R.	Littleton
Query, Richard Z.	Hendersonville
Quickel, Thos. C.	Gastonia
Quillen, Emile B.	Rocky Mount
*Quinn, Robert F.	Magnolia
Raby, J. G.	Tarboro
*Rainey, W. T.	Fayetteville
Ramsey, James G.	Salisbury
Rankin, P. R.	Mount Gilead
Rankin, R. B.	Kannapolis
Rankin, Watson S.	Charlotte
Ranson, J. Lester	Charlotte
*Ravenel, S. F.	Greensboro
Ray, F. L.	Charlotte
*Ray, John B.	Leaksville
Ray, O. L.	Raleigh, Rt. 1
Ray, R. C.	Beaver Creek
Raymer, M. B.	Winston-Salem
Reaves, C. R.	Greensboro
Reaves, W. P.	Greensboro
Redding, Alex H.	Cedar Falls
Redfern, T. C.	Winston-Salem
*Reed, D. H.	Kenansville
Reed, John F.	Concord
Reeves, A. F.	Asheville
Reeves, B. E.	W. Jefferson
Reeves, R. J.	Leicester
*Register, F. M.	Raleigh
Reid, Geo. P.	Forest City
Reid, James W.	Lowell
Reid, Thos. N.	Matthews
Reitzel, C. E.	High Point
*Reynolds, C. V. (Hon.)	Asheville
Reynolds, T. F.	Canton
Rhodes, James S.	Williamston
Rhyne, Robt. E.	Gastonia
Rhyne, S. A.	Statesville
Richardson, Jas. C.	Monroe
*Richardson, F. H.	Black Mountain
Ricks, Leonard E.	Fairmont
*Riddle, J. B.	Morganton
Rigsbee, A. E.	Durham
Ring, Joseph W.	Elkin
Ringer, Paul H.	Asheville
Roberson, Charles	Greensboro
*Roberson, Foy	Durham

Name	*Address*
Roberts, Bryan Nazer	Boardman
Roberts, Frank	Marshall
*Robertson, James F.	Wilmington
*Robertson, J. N.	Fayetteville
*Robinson, J. D.	Wallace
Robinson, W. F.	Mars Hill
Robinson, W. J.	Creston
Rodgers, W. D.	Warrenton
*Rodman, J. C. (Hon.)	Washington
*Rodwell, John W.	Mocksville
Rogers, Jas. Rufus	Raleigh
Rogers, W. A.	Franklin
*Root, Aldert S.	Raleigh
Rose, A. H.	Smithfield
Rose, David J.	Goldsboro
*Ross, Geo. H.	East Durham
*Ross, Otho B.	Charlotte
*Ross, Robert A.	Durham
Ross, Robt. D.	Wadesboro
Rosser, R. G.	Vass
Rousseau, J. P.	Winston-Salem
*Royal, Ben F.	Morehead City
*Royall, M. A.	Elkin
*Royster, Hubert A. (Hon.)	Raleigh
Royster, S. S.	Shelby
Royster, Thos. H.	Tarboro
Royster, Thos. S.	Henderson
Royster, W. I. (Hon.)	Raleigh
Rozier, R. G.	St. Pauls
Rucker, A. A.	Rutherfordton
Rudisill, J. D.	Lenoir
Russell, C. R.	Granite Falls
Russell, Jesse M.	Canton
Russell, Lloyd P.	Fletchers
Sabiston, Frank	Kinston
Sadler, R. C.	Whiteville
Saliba, John	Elizabeth City
Saliba, M. M.	Wilson
Salley, E. McQueen	Saluda
Salmons, H. C.	Elkin
Salmons, L. R.	Winston-Salem
Sample, R. C.	Hendersonville
Sams, W. A.	Marshall
Saunders, Jos. H.	Williamston
*Sawyer, Chas. J. (Hon.)	Windsor
Sawyer, W. W.	Elizabeth City
Scanlon, W. G.	Charlotte
Schallert, P. O.	Winston-Salem
Schaub, O. P.	Winston-Salem
*Schenk, Sam M.	Shelby
Schoenheit, E. W.	Asheville
Schonwald, J. T. (Hon.)	Wilmington
Schoonover, R. A.	Greensboro
Schuler, J. E.	East Durham
Scott, Charles L.	Sanford
Scott, R. C.	Asheville
Scott, S. F.	Union Ridge
Scruggs, F. B.	Cliffside
Scruggs, W. H.	Asheville
Scruggs, W. Marvin	Charlotte
Seay, T. W.	East Spencer
Sessoms, E. T.	Roseboro
Sevier, D. E.	Asheville
Sevier, J. T.	Asheville
Sexton, C. Hector	Dunn
Shafer, Irving E.	Salisbury
Shamburger, J. B. (Hon.)	Star
*Sharpe, C. R.	Lexington
Sharpe, F. A.	Greensboro
Sharpe, Frank L.	Statesville
Sharpe, O. L.	Greensboro
Shaver, W. T.	Badin
Shaw, J. A.	Fayetteville
*Shaw, W. G.	Wagram
Shepard, F. A.	Liberty
Shellum, O. W.	Denver
Sherrill, C. L.	Statesville
Shields, Henry B.	Carthage
Shirley, H. C.	Charlotte
Shohan, Jos.	Greensboro
*Shore, Clarence A.	Raleigh
Shreve, J. R.	Brown Summit
Shuford, Jacob H.	Hickory
Shull, J. Rush	Charlotte
*Sidbury, J. B.	Wilmington
Sigman, F. C.	Spencer
*Sikes, G. L.	Salemburg
*Sikes, G. T. (Hon.)	Creedmoor
Simmons, L. L.	Greensboro
*Simmons, R. R.	Winston-Salem
Simpson, H. H.	Altamahaw
*Singletary, G. C.	Clarkton
Sink, C. S.	N. Wilkesboro
*Sisk, C. N.	Greensboro
*Skinner, Louis C.	Greenville
*Slate, John S.	Winston-Salem
Slate, J. W.	High Point

Name	*Address*
Slate, Wesley C.	Spencer
*Sloan, A. B.	Mooresville
*Sloan, D. B.	Wilmington
*Sloan, H. L.	Charlotte
Sloan, Wm. H.	Garland
Slocum, R. B.	Wilmington
Sloop, Eustace H.	Crossnore
*Small, Victor R.	Clinton
Smith, A. Jones	Black Creek
Smith, Annie T.	Durham
Smith, B. R.	Asheville
Smith, C. T.	Rocky Mount
*Smith, F. C.	Durham
Smith, G. M.	Monroe
*Smith, J. A.	Lexington
Smith, James B. (Hon.),	Pilot M't'n.
*Smith, James T.	Westfield
*Smith, John McN.	Rowland
*Smith, Jos. E.	Windsor
*Smith, L. J.	Wilson
Smith, O. F.	Scotland Neck
*Smith, Owen	High Point
Smith, R. A. (Hon.)	Goldsboro
Smith, R. C.	Grifton
Smith, R. E.	Winston-Salem
Smith, Robt. W.	Hertford
*Smith, Slade A.	Wilmington
Smith, W. F.	Chadbourn
*Smith, Wm. H.	Goldsboro
Smithwick, Jas. E.	Jamesville
Smoot, J. E.	Concord
Snipes, E. P. (Hon.)	Jonesboro
Soady, J. H.	Garner
Somers, L. P.	New Castle
*Sossoman, J. C.	Midland
Sowers, Jacob L.	Lexington
Sowers, Roy G.	Jonesboro
Spainhour, Ellis H.	Winston-Salem
Sparrow, Thos. DeL.	Charlotte
*Speas, D. C.	Winston-Salem
*Speas, W. P.	Hickory
Speed, J. A.	Durham
Speight, J. A.	Rocky Mount
Speight, John W.	Roper
Speight, J. P.	Rocky Mount
Spencer, Frederick B.	Salisbury
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TRANSACTIONS

OF THE

NORTH CAROLINA PUBLIC HEALTH ASSOCIATION

SIXTEENTH ANNUAL SESSION

WRIGHTSVILLE BEACH, N. C.

MONDAY, JUNE 14, 1926

TRANSACTIONS

OF THE

NORTH CAROLINA PUBLIC HEALTH ASSOCIATION

SIXTEENTH ANNUAL SESSION

Wrightsville Beach,

Monday, June 14, 1926.

The North Carolina Public Health Association met in the ocean front rotunda of the Oceanic Hotel at 10:30 a.m., and was called to order by the President, Dr. S. E. Buchanan, Concord.

The invocation was said by the Rev. A. D. P. Gilmour, pastor of the First Presbyterian Church, of Wilmington.

REPORT OF THE SECRETARY

F. M. Register, M.D., Raleigh

The fifteenth Annual Session of this Association was held in Pinehurst, Monday, April 27, 1925, at Carolina Inn. Invocation was pronounced by Rev. T. A. Cheatham, followed by a splendid address by our president, Dr. L. L. Williams.

The officers for this meeting were: Dr. L. L. Williams, President; Dr. Sidney L. Buchanan, Vice-President; Dr. F. M. Register, Secretary.

The meeting of the Association was a most interesting and instructive one. We were fortunate in having with us as the main speaker of the evening session Dr. James A. Doull, associate professor of epidemiology of the Johns Hopkins University, whose talk was most interesting and helpful.

The following committees were appointed:

Visitors and New Members: Dr. R. L. Carlton, Winston-Salem; Dr. E. T. Hollingsworth, Clinton; Dr. W. T. Ruark, Elizabethtown.

Resolutions: Dr. S. L. Buchanan, Concord; Dr. C. L. Outland, Greenville; Dr. A. C. Bulla, Raleigh.

Moving Pictures: Dr. L. J. Smith, Wilson; Dr. C. W. Armstrong, Salisbury; Dr. W. A. McPhaul, Charlotte.

Committee on President's Address (appointed by Dr. S. L. Buchanan, Vice-president): Dr. E. H. Hand, Pineville; Dr. W. A. McPhaul, Charlotte; Dr. R. L. Carlton, Winston-Salem.

Dr. Smith, Chairman of the Moving Picture Committee, reported that the Committee recommended the appointment of Dr. M. L. Townsend to take up the matter of moving pictures further and report at the next meeting of the Public Health Association.

The following officers were elected for the new year: President, Dr. Sidney L. Buchanan, Concord; Vice-President, Dr. E. R. Hardin, Lumberton; Secretary, Dr. F. M. Register, Raleigh.

APPOINTMENT OF COMMITTEES

The following committees were appointed by the President:

Visitors and New Members: Drs. C. C. Hudson, Greensboro; W. T. Ruark, Elizabethtown; Edgar H. Hand, Pineville.

Resolutions: Drs. L. Jack Smith, Wilson; C. L. Outland, Greenville; C. W. Armstrong, Salisbury.

PRESIDENT'S ADDRESS

GOOD HEALTH AS A FOUNDATION FOR GOOD CITIZENSHIP

S. E. Buchanan, M.D., Health Officer, Cabarrus County, Concord

It is a common weakness of mankind to be caught by an idea and to rest there; to neglect to carry the idea into practice is a weakness still more common. It is the failure to test these ideas by putting the theories into action that causes them to be unpopular and distrusted. The old saying, "A sound mind in a sound body" is all right, but in our time it is, and justly so, considered just the opposite, "A sound body and a sound mind." Our forefathers were content with the ideal, but in this age we long for reality and doubt the virtues of blind submission and resignation, calling out instead for prevention and amelioration. Disease is no longer regarded as the penalty and the consequence of sin. Nature is now perceived to be capable of imperfect work. The time was when the eye was referred to as a perfect apparatus, but the number of young children wearing glasses makes the idea unthinkable today. There is a physical basis for citizenship, as there is a physical basis of life and health; and any one that will take the trouble to think the subject over will see that prevention is a text and the making of sound citizens a sermon. Given a sound body, we have nowadays little fear for the sound mind, as a sound body generally means a sound mind. If a child is mentally dull on account of imperfect ears, we do not try to correct this dullness by educating the brain, but, instead, the remedy is in the treatment of the body medically or surgically. If a child lacks initiative and energy on account of adenoids blocking the air passages, we do not try to correct this by employing better teaching methods; we try to give this child a sound body by the removal of the defect, and this done the loss of energy and initiative is restored.

How are we to go about this question of good health? There is only one way to my mind that is open to us, and that is by education and correction of physical defects. When I speak of education I have in mind health education beginning in the primary grades of our public schools. By this method, and this method only, can we hope to accomplish our aim and ideal, good health and good citizenship. It is no easy task and one that cannot be accomplished in a day. Some one might say, why not start in the home with the parents, teach them and let them teach the children and not burden the schools with this, as their work is to teach the three R's? There are two reasons which come to my mind why this

is not practical. The first is easiest explained by using the old expression, "It is hard to teach an old dog new tricks." In giving the second reason I will ask the question, how many of you have children at home? If you have you know the reason, for you know just how much easier it is for your neighbor to teach your child something than it is for you to do so yourself. You, as health officers, have all seen how much easier you can handle the children in the school than you can during your typhoid campaign when their parents are with them. As I have said before, begin health education in the primary grades of your public schools by teaching health habits and you will reach the parent easier and quicker than in any other way. How are these health habits going to be taught and by whom? The health officer? No. The nurse? No, that is not possible on account of the number of schools. By the teacher? Yes, with the support and assistance of health officer and nurse. As to the method of teaching health habits, that is a question for the individual health officer and teacher to decide, and as I see it, one method is just as good as another, as it is the result in the end you are after. Just suppose every whole time health officer in North Carolina could get every primary teacher in his county to carry out a program of this kind, what would it mean to our state in the future from a health standpoint? What would it mean to the citizenship of our state in the future?

Should health education stop with the primary grades? No, but carried on into the grammar grades as a part of the curriculum and not as in the primary grades, but as a regular course in hygiene. This may be required at present, I can not say; but I can say that if it is it is being sadly neglected in a great number of the schools, or is so poorly taught that it is practically useless, as shown by the attitude of the teacher and pupil toward disease prevention. A health officer or nurse can tell without questioning whether or not hygiene is being properly taught in the school by visiting in the community a number of times. I remember going to a colored home during the past summer to quarantine a case of contagion, and much to my surprise I saw one of the boys mashing tin cans with an ax. I asked him what his idea was for mashing the cans and he informed me that if he didn't mash the bottom out they would hold water and breed mosquitoes. I immediately asked him where he went to school, for there was no other way for him to get this information. What can be done for this negro boy can be done in every school in the state. As to what would be accomplished in this state in a few years if every teacher would do as this negro teacher did, I will leave it to you to say.

From what I have just said it would seem that I am advocating health education to the children alone. This is not my intention at all. To accomplish our ideal we must start here; at the same time every resource must be used to educate the older generation along health lines also. To educate the older person we have a different problem to deal with. He is mature and not like the child; he is skeptical; he will have to be handled through personal contact, as he has to be convinced. One may do a great amount of good through the public press or community meetings, but here you are handicapped by not reaching the per-

son in the greatest need of health education. To reach that class, not reached by the press and public meetings, I consider the moving picture one of the greatest assets.

Our ideal of good health to be accomplished demands that we have physical defects corrected. Education alone cannot do this. It will be the means to an end, for with our people properly educated in good health, the task of getting the defects corrected has been lessened. Sufficient hospitals with competent staffs will not be so hard to secure when the people are cognizant of the benefits of good health. Not until our health education program has been carried across will the people realize that our physically defective are a burden to the public just as much as our mental defectives are. Years ago our people depended on private individuals to furnish our schools to a great extent. Now the education of our children is a public problem, and so in the near future will the hospitals of the state be carried on by the state and local governments. Then and not until that day comes shall we be able to correct our physically defective.

In what way does good health affect good citizenship? By the habit of healthy living industrial efficiency is improved, employment better, pay better, and with this comes contentment; and without contentment goes the temptation to steal, lie or do physical violence. The different elements of industrial efficiency are concerned with every person's habit of living—the worker himself, the product of his labor, his employer, his employer's profit, his trade, his earnings, and his nation. When these elements are seen and understood, we as parents and health officers have strong reasons for endeavoring to instill good health habits in the children. We have seen how good health habits affect efficiency, and how efficiency leads toward good citizenship. Now, how does the lack of proper health habits, which are necessary to good health, affect efficiency? The use of alcohol gives us the best illustration. The penalty suffered by the man and his family is bad enough, but because he is not in possession of his faculties he is not punctual, he is wasteful, ignores instructions, lessens the product of his trade, lessens profit to himself and his employer, depresses wages, and with all these come discontentment and unrest, which open the way to temptation and poor citizenship.

In our health program I feel that we are not putting forth as much effort on health education as we should. There may be several reasons for this. First, our reports would suffer, as there is no credit under our present system for educational work. For our earnings to fall down might be disastrous. Second, it is discouraging; the results are so far distant and every one can do better work if he can see the results of his work. Even though our reports may suffer, even though the final results are far distant, I feel that it behooves us as health officers to put our shoulders to the wheel and push an intensive educational program across, for with this we have good health and with good health we have good citizenship.

ADDRESS

WILLIAM DEB. MACNIDER, M.D., President, Medical Society of the State of North Carolina, Chapel Hill

In making a few statements about this subject, I want to ask this organization to let me speak simply as an individual, and to ignore my connection with any educational institution. If you will do that, I think I can speak freely.

I was glad that the president of the North Carolina Public Health Association, in his address, concerned himself with public health education. Of course, you are all heartily in favor of what he said, but it seems to me that there is another phase of public health education which we have not laid hold on as we should, and which it seems to me is of the utmost importance. In medical education we have made enormous advances, and medical students have taken advantage of those advances in medical education. They may have gone too far, but my feeling is that after a while, when we get back to a balanced place in medical education, we shall have a better type of physician, and that statement is made without any criticism of the remarkable physicians that have gone ahead of the group that is coming now. I think the science of public health has made greater strides than the science of medicine, but I am wondering if the public health official has taken advantage of the advancement in public health education as medical students have had to take it. A public health officer, as I see it, can no longer be a pleasant gentleman who is elected by some board and who does, in an excellent fashion, a superficial kind of health service. If a public health officer, at the present time, is going to function in an efficient fashion I am quite sure he has to be scientifically trained in order to function, just as a medical student has to be trained in an entirely different fashion from what he was even fifteen or twenty years ago, in order for him to function. There is no question, certainly in this state, concerning the necessity of our public health work and the ideals we have established for it. That has been recognized, and has been recognized by one of the strongest foundations in this country. We could not have had a finer beginning in public health than the men who have gone before us, Dr. Wood and Dr. Thomas and Dr. Lewis, and finally the man selected to head up a great humanistic ideal such as none of us had thought of before, Dr. W. S. Rankin. We have done well, but my only thought is, have we done as well as we could have done? Are we modern, scientifically trained public health officials?

The question then comes up, where can we study public health? Should a man, before he takes charge of a municipal or county health office, have a degree of doctor of public health? I have my feeling about that. I think sometimes a man can be so scientifically trained that he is trained away from the thing he is trying to do. I think he can be overtrained. I am not in the least disparaging the doctorate of public health, but is there any education of a specific character that a man can get now other than that leading to the degree of doctor of public health, which requires such an expenditure of time and money that it practically excludes a great many? I do not believe there is, except in the medical curriculum, which is so overcrowded now that it will scarcely admit of a

course in public health. I can not imagine any better thing that medical schools in any state could do than to offer say a one year's course of instruction, to start with, in the branches of medicine relating to public health, in biology as applied to public health and sanitation, in bacteriology. It might be started with this and later add another year in which the man works in vital statistics in public health offices in different states. Then work in the state laboratories of hygiene; then have from two to six months' practical experience out in the field, learning field methods and becoming better acquainted, in a laboratory fashion, with the work he has to do. It seems to me this would do two things: It would give the counties and municipalities an opportunity to have health officers with specific information along public health lines; and, at the same time, it would give the men an understanding of and an introduction into what public health is. I believe each year more men would quit their work and take courses in an institution and become doctors of public health, and, when they became doctors of public health, they would have some sound foundation, and would find out if their theories would fit in with the matters they have to handle. It seems to me an educational institution in any state would be of immense value to public health officers in the towns and counties if such work in public health could be given, and I wish something could be done about it.

I appreciate very much your kindness in letting me say these few things.

APPOINTMENT OF COMMITTEE

On motion of Dr. W. J. Hunnicutt, Asheville, seconded by Dr. L. Jack Smith, Wilson, the President was authorized to appoint a committee to consider the matter of public health education and consult with the State Board of Health in reference to the matter. The following committee was later appointed: Drs. C. W. Armstrong, L. Jack Smith, and R. L. Carlton.

DIARRHEA AND ENTERITIS AS A PUBLIC HEALTH PROBLEM

John H. Hamilton, M.D., County Health Officer, Wilmington.

Of the 33,234 deaths occuring in the state of North Carolina in 1924, 1,735 were due to diarrhea and enteritis. Contrast these 1,735 from diarrhea and enteritis with the 270 deaths from typhoid or with the 323 deaths from diphtheria. Of the 1,735 from diarrhea and enteritis, 1,484 were in children under two years of age. Of these, 862 were white children, 611 negro, and 11 Indian. In 1924 there were 8,757 deaths in children under two years of age. Thus we have in diarrheal diseases the cause of 16.9 per cent of all of the deaths under two years of age. From this hurried survey of the statistics, we gain an approximate idea of the magnitude of the problem.

In 1925 there were 1,308 deaths from diarrheal diseases in children under two years of age. This represents a decrease of 176 or about 12 per cent from the total of 1924. Only five counties in the state were able to report no deaths from diarrheal diseases. The seasonal distribution is as follows:

January, 11; February, 16; March, 22; April, 45; May, 138; June, 304; July, 245; August, 136; September, 133; October, 110; November, 66; December, 55.

In speaking of diarrhea, we must remember that we are merely dealing with a symptom and that we should endeavor to be more specific. We have diarrhea due to dietary indiscretions, to improper food, etc. While we may have a variety of causes, the most frequent and important one is infection with pathogenic organisms. Of these the dysentery bacilli are principal factors. The laity and even the profession are so prone to blame diarrhea on heat, on teething or other causes of like nature that it has taken repeated demonstrations of the presence of dysentery bacilli to convince even a small number of people of the fact that bacillary dysentery is prevalent in this country. Duvall and Bassett first proved in 1902 that bacillary dysentery occurs in children of America. Their work has been confirmed by numerous workers, especially those in New York, Boston and Baltimore. Davidson in Baltimore found dysentery bacilli in 83 per cent of a small series of cases of clinical dysentery. Barret of Charlotte has isolated dysentery bacilli from children in Charlotte. We cannot dodge the fact that we have bacillary dysentery in our midst and that it is costing many lives each year. We may feel safe in calling bloody diarrheas, dysentery, but before we can make much headway in the scientific control of dysentery we must have a sufficient number of laboratory diagnoses to convince even the cynics that we are dealing with a virulent infectious organism. The laboratory diagnosis consists in isolating and identifying the organism from the feces of patients suffering with diarrhea. A microscopic examination should be made of the stool to determine the presence of amebae or other animal parasites. While the organism may be secured by blood culture it does not occur in the blood stream with sufficient regularity for the blood culture method to be of diagnostic value. The method of isolating the dysentery bacillus from specimens of feces is essentially the same procedure as in typhoid, the Endo, brilliant green, or eosin-methylene blue plates being used. Suspected colonies are fished and inoculated on Russell double sugar slant and confirmed or identified by agglutinating with known antisera.

Bacillary dysentery is a specific infection caused by bacillus dysenteriae, of which there are a number of strains. It is a Gram negative, non-sporeforming, non-motile bacillus belonging to the typhoid colon group. There are at least four different strains: Shiga, Flexner, Strong, Hiss Y. The Flexner type is most common in this country. A strong toxin is formed by the Shiga strain, and this toxin when injected intravenously into the rabbit causes a faithful reproduction of the symptoms and lesions of bacillary dysentery. The toxic substances are probably endo-toxins, one a neuro-toxin and another entero-toxin.

The resistance of the dysentery bacillus to germicides is about the same as that of other spore-free organisms. Bacillary dysentery is usually a self limiting disease, running an acute course without complications or sequelae. The immunity acquired by an attack of the disease is very slight and recurrences or reinfections within a short time after apparent recovery are common. It is not unusual for a child to have two or more attacks during the course of a summer. It occurs in all climates and all countries. It has a tendency to summer prevalence. Its preva-

lence increases as we approach the Equator, but severe outbreaks occur in Temperate and even Arctic regions. It affects all ages but is much more common in young children, especially infants. The disease occurs in great epidemics, in local outbreaks, and sporadically. The severity of the disease varies greatly, the fatality often running as high as 30 per cent.

The source of the organism is the intestinal tract of man. Great numbers are found in the feces of patients and convalescent patients, a considerable number of whom are chronic carriers. Healthy carriers, that is persons who harbor the organism without having had the disease, have not been demonstrated. In carriers the excretion of the bacilli is intermittent, and none may be found for weeks or months. They return in gradually increasing numbers until there are more dysentery colonies found on the plate than colon. Carriers probably play a more important part in the spread of the disease than we have hitherto suspected.

Health workers can do little in controlling an infectious disease unless known and suspected cases are reported promptly. Each patient suffering from diarrhea in which there is blood in the feces should be considered as a suspected case of dysentery. As soon as the health officer is notified of a case of diarrheal disease steps should be taken to insure the proper disposal of infectious material. He should remember that he is dealing with a disease in which the infectious agent is disseminated in exactly the same manner as the infectious agent is disseminated in typhoid, and that the fatality rate is just about as high as that of typhoid. All infectious material should be carefully collected and immediately disinfected. For some reason many people who would be most careful in caring for excrement from adults are most careless in disposing of excrement from babies. Diaper wash water is too often thrown on the ground, where flies have free access. Undisinfected diapers are hung on the line in the shade. Dr. Levy, while health officer of Richmond, reduced his diarrheal rates markedly by having his nurses give careful instruction in the care of diapers and their contents.

Although dysentery may be conveyed by water and milk and other foods, the fly is much more commonly the vector. There is considerable evidence of contact infection particularly in families and institutions.

Inasmuch as the sources and modes of infection of the dysentery bacillus are the same as those of the typhoid bacillus, the methods of control are the same in so far as they apply to general sanitary measures.

While immune sera have been prepared which seem to have some therapeutic value, they apparently have no value as preventives. Vaccines may prove of some value, but the prospect of controlling dysentery by means of vaccines is rather unfavorable due to the faint immunity responses to natural infections.

Dysentery offers a challenge to the health workers of North Carolina. Other conditions which have confronted us in the past have been dealt with successfully. It is not too optimistic an outlook to prophesy that the challenge will be met and dealt with in such a manner as to uphold the traditions of the state.

DISCUSSION

Dr. H. P. Barret, Charlotte: There are several points in Dr. Hamilton's paper that I think need bringing out and maybe elaborating more. One thing he said which has always been a puzzle to me, and that is that "Dysentery offers a challenge to the health workers of North Carolina." It has been offering a challenge for a long time, and I think it is about time you took up that challenge. Think of losing 1500 children every year—not once in a while, but every year. The average for the last seven years has been 1477—nearly 1500. That occurs every year, and how much work is done to prevent it? I am afraid not a great deal, except in isolated instances. Suppose you had a dozen cases of meningitis in children at the same time in your community! There would be an awful howl; there would be a lot of work done, and all sorts of newspaper and other publicity would be given to it, just for a few cases, with possibly two or three deaths, whereas here you have every year 1500 deaths. That, to me, is the biggest thing about it. Last year, in Charlotte, we had twenty to thirty cases of poliomyelitis, and the Government even sent a man down to investigate it. Probably we had two or three deaths, whereas we have 1500 deaths in North Carolina every year from dysentery, and how much attention is paid to it? Too little; in fact almost none.

I would not be so presumptuous as to make any suggestions to this body of men, but there are four things I should like to mention. First is the name of the disease. We do not call typhoid fever and other diseases by their old-fashioned names; we call it typhoid. Here we have bacillary dysentery, yet we call it colitis and summer complaint and other old-fashioned names. Probably all these children die from bacillary dysentery; i.e., dysentery due to the bacillus dysentery. First, then, let's call the disease by its proper name. Second, it should be reportable to the state health department under that name. In all of the counties I know anything about, it is not even a reportable disease. We know how many deaths we have, but not how many cases. It ought to be a reportable disease, just as typhoid is. Third: Another thing that should be done and can be done, and which has been done in some quarters of the state, is to make cultures from all these cases, so we shall know what type we have. There are two main types, but quite a few subtypes, and until we make cultures we shall not know with what type we are dealing. In this connection I am here to say that I am always ready and willing to make cultures from any and all cases you may have. If notified I will gladly, and without expense to any of you, come to your community and make the cultures. Fourth: Something should be done in the way of preventing this disease. Typhoid can not be prevented by vaccination alone, nor by health measures alone, but by a combination of the two. Now, as Dr. Hamilton said, vaccination in dysentery has been a rather unsatisfactory thing. It is unsatisfactory chiefly because it is a very toxic vaccine, and frequently causes very severe local reaction, and it has caused death. I have been very much interested in vaccination by mouth in this disease. This method of oral vaccination has been tried out very thoroughly by various workers in France, where it has been applied to grown people rather than to children. So far as I know it has not been

used in this country, except experimentally. Enlowe, working at the Hygienic Laboratory in Washington, has done some very careful experimental work on the vaccination of animals by mouth against dysentery infection, and with very encouraging results. According to the French workers, it has proved a very satisfactory method of vaccination and could be applied very well to children, for it would be no trouble to give this vaccine in that way. I have been fortunate enough to get one or two health officers interested in trying to do something in the way of isolating the different types of organisms and vaccinating against the disease. In Charlotte last year we vaccinated 300 children. That was hardly enough to draw any conclusions from, though we did get some very satisfactory results. Dr. Hollingsworth, of Clinton, who is health officer of Sampson county, has been kind enough to offer to vaccinate his whole county, and we are going to work with him next year. This year we are simply making cultures from the cases he has, so as to know what type of vaccine to give. Dr. Hudson, in Greensboro, is also helping me in getting cultures, and I should be glad to make cultures for any health officer in North Carolina, free of charge.

Dr. L. Jack Smith, County and City Health Officer, Wilson: This paper has been discussed very admirably and adequately from two angles. We have been told our problems, and it is a problem. We have been told the scientific viewpoint on this problem, but we have not been told any very practical method of meeting it. This disease, being a disease in curative medicine, can not logically be entered into by health workers. I say that advisedly, because this body has been criticised on too many occasions for entering the field of curative medicine. So I rise to offer this as a solution to this problem: That we present this matter to the medical societies of our counties, in a manner that will impress them with the importance of it, and in a manner that will place the responsibility on them, and in a manner that will assure them the coöperation of the health department or any other department of the local government. I offer that as a suggestion, that every health officer of this organization go home and put it up squarely to his county medical society. It is not a matter of prevention only; it is a matter of curative medicine, and for that reason we can not handle it alone, but must put it up to our medical societies.

Dr. E. T. Hollingsworth, Health Officer Sampson County, Clinton: This matter was brought up before the Sampson County Medical Society a short time ago, and a very able paper was read on it. That writer said it is not a problem of curative medicine, but a matter of prevention.

Dr. E. R. Hardin, Health Officer Robeson County, Lumberton: I agree with Dr. Barret that bacillary dysentery ought to be a reportable disease. There is no doubt about the enormous number of deaths due every year to this disease. I do not see how we can do much until we get accurate reports on it from the physicians who see the cases. I agree with Dr. Hamilton's statement that it is largely transmitted by flies, but I have noticed in some years the disease is much more prevalent than in other years, especially in the early spring. For instance, in 1921 we had more bacillary dysentery in May than through the rest of the year. Why this is true, I do not know. I think this thing has a public health

angle; but it is largely the prevention of contamination of babies' food by flies. Like all other health problems, it has an economic side to it, for many people are too poor to buy ice to keep the baby's food cool, and too poor to keep it protected from contamination by flies. For that reason many of them use condensed milk, or some other substitute. Many have no idea of keeping the bottles clean. Often in the Indian and negro homes, and in the homes of the poor whites, we find them feeding the baby out of any old bottle they find around the house, with no idea of keeping it clean, and using the same bottle for the twenty-four hours.

Dr. D. E. Ford, County and City Health Officer, New Bern: We have to get some sort of coöperation from the medical profession first, have it understood what the disease is, and have them coöperate with us in the handling of it. But first we have to get information. It seems to me we know as little about bacillary dysentery as we did about typhoid thirty years ago. We do not know how many cases there are, nor how many deaths there are. We must admit that vital statistics in different parts of the state have different values. There are some counties that have no deaths from bacillary dysentery from year to year, it may be because the deaths are not reported, or because the diagnosis is not correct. We should agree upon methods to be used by all the health officers in the state. Those who know most about the disease could draw up a questionnaire or list of points in regard to the epidemic character of the disease, for all health officers to study and send in to headquarters. In that way some method might be devised during the course of the year for handling the disease. We think we know something about dysentery, but there are many points on which we are not certain. If the men in the department of epidemiology and in the state laboratory could get up some set of suggestions for us to follow, and if we could get the physicians to coöperate in reporting cases, we might gather some statistics upon which to base methods for prevention.

Dr. C. C. Hudson, City Health Officer, Greensboro: I disagree with Dr. Smith when he says this is a matter for us to put up to the physicians. This is a problem of preventive medicine, and is one for us to handle. It has been demonstrated in cities all over the country that diarrheal diseases can be prevented. When Dr. Barret tells us most of the deaths are from dysentery, he is right.

In Greensboro we have three mill villages, and a nurse is in charge of each village. Last year, in one of the sections, which is just as large as or possibly a little larger than the others, we had no deaths from diarrheal diseases. In the other sections, with a population of 7,000, there were nine deaths from diarrheal causes. In the main part of Greensboro we had about six deaths, in a population of eighteen or twenty thousand.

We should put it up to our health departments to deal with this problem. We know that we can save quite a number of lives each year by directing our attention to this work and applying the knowledge we now have.

I want to move, Mr. President, that a committee be appointed from this organization to study this problem and work with Dr. Barret and Dr. Shore and devise a practical method of handling this problem.

Motion seconded.

Dr. Smith: I should like to correct a seeming error of Dr. Hudson as to my attitude in this matter. I did not mean to shift the responsibility from the health department, at all. What I was trying to do was to put the responsibility on the health department, plus the medical profession.

The motion was carried and the following committee was later appointed: Drs. H. A. Taylor, C. C. Hudson, and E. T. Hollingsworth.

ADDRESS

K. E. Miller, Surgeon, United States Public Health Service, New Orleans, La.

I have just been up to Baltimore, and was impressed there with what seems to me to be a very serious question in medical education. You know Johns Hopkins University has, as an integral part of its medical department, a great School of Hygiene and Public Health. No doubt some of you have been there. It is a great institution, magnificent in every respect. I was inquiring of Dr. Frost and others there as to the relation of this institute of hygiene and public health to the medical school. Now when I was in medical school in Hopkins, from which I was graduated in 1912, I was impressed with the fact that we got no insight into public health. There was a course in what was called hygiene, conducted by a man who had never been in the field in his life,—a very inadequate and impractical course. I naturally supposed on my recent visit there that from this magnificient institute the undergraduates in medicine were receiving much benefit. I assumed the undergraduates were taking courses over there. I was astonished to find that the situation is exactly as it was in 1912. The undergraduates derive no benefit from that institution. It might as well be in another part of the work, since there is no liaison between the curriculum of the undergraduates and the School of Public Health. It seems to me our biggest problem right now is not so much educating the public, which we all have to do, but the thing we have not done as well is to inculcate in the minds of the men who go out to practice medicine some conception of public health. They come out of school with the feeling that public health is something entirely foreign to the practice of medicine. I think the next great step in public health for the future must be through the medical practitioner. I do not mean to say that every medical practitioner is going to aspire to a job as health officer; not that at all; but every medical practitioner comes daily in contact with things that have to do with public health, with preventive medicine. He is in it whether he wants to be or not, and I think we should give him an intelligent understanding of what it is about and how he can best discharge his public health functions. In so far as practicable it is best to interest and encourage the practicing physicians to take a hand in the work which belongs essentially to the field of public health. You know how the practicing physicians have taken up typhoid vaccination since it has been popularized by health workers; and how, in like manner, the hookworm treatment has been taken up by the practicing physician. We thought we were going to eradicate hookworm by putting on a few men to conduct county eradication campaigns, but we know now that this was merely the beginning. The

real good we did was to educate the practicing physician to take up the job himself. Of course, we have educated the people as to the symptoms of hookworm disease and to go to the doctor, who now looks for hookworm and treats those found infected. They come to the health department in ever diminishing numbers, and that is as it should be. The getting rid of hookworm disease is a treatment measure, but it is one with a large public health significance, because any disease that is communicable has public health significance and must be regarded as a public health measure regardless of whether or not treatment is involved. If we could get the doctors to do all the work they can do that has public health significance, the health department will have more time for the routine duties and for matters that the practicing physician can not handle. We must impress our doctors with the fact that they have a large part to perform in the field of public health and preventive medicine; that their routine duties necessarily bring them in contact with this work, and that they should get some vision of the importance of it, such as they have never gotten in their undergraduate training. I was very much interested in the resolution passed here to take this matter up with the State Board of Health, looking to some recommendations along this line. I do not know what the University of North Carolina is doing, but I should like to see every medical school take a real, sound interest in it. I must say again that I was very much chagrined to see that Johns Hopkins Medical School, one of the foremost in this country, is absolutely neglecting the training of undergraduates in public health principles.

THE DEVELOPMENT AND CARE OF THE TEMPORARY TEETH

E. A. Branch, D.D.S., Wake County Health Department, Raleigh

I realize that any form of public health work is a matter of salesmanship to some extent, for the simple reason that we have to convince the people that what we have is a good article and they need it. We have to sell it to them. In discussing the development and care of the temporary teeth, we are beginning at the foundation of what I conceive to be a most important health measure.

To begin with, the question that is more often asked the dentists than any other by the mothers is, at what age should I first take my child to the dentist? Now the answer to that is, before the child is born. The first picture here is the mother in waiting. The reason she should take the baby to the dentist before the baby is born is that the dentist may explain to her the importance of the proper care during pregnancy, not only for the preservation of her own teeth, but for the teeth of the child. We know the first sign of tooth structure is at about the twelfth day of embryonic life, but the tooth is really beginning to form at the eighth week. The enamel of the teeth is 98 per cent. mineral matter, largely lime. The mother must provide this lime in the diet, and if she does not provide it in the diet her system is robbed of a sufficient amount to form the bones and teeth of the child.

If her system can not supply it, then the teeth get all they can, but are not sufficiently formed. Ninety-eight per cent of the enamel is mineral matter.

The mother must know, when the baby is born, that the best food for the baby, in order for it to have good teeth, is breast milk. There is nothing that will take the place of breast milk. She must know, too, that the child must be fed regularly, because that has a very great bearing on the development of the child, and the development of the child's teeth must go right along with the other development.

The mother must be taught that in order for the baby to have good teeth, if she can not supply breast milk the next best food is cow's milk, but she must be impressed with the fact that this cow's milk was meant for the cow's baby and not for the human baby. If it is to be supplied for the human baby, it must be supplied under the direction of a competent physician, so that the milk may be properly modified and will agree with the child as it should.

If the baby is being fed cow's milk, the next important thing is that the milk must be clean. If there is any doubt about the milk supply's being clean, we should advise the feeding of pasteurized milk. If she feeds the baby on pasteurized milk, she must feed orange juice along with it.

Now, if it is very important for a piece of machinery to be examined regularly, how much more important is it for the child's mouth to be examined regularly to see that it is in good condition? We liken the mouth to a piece of machinery that must be kept in order, and to keep it in order it must be regularly examined.

We come now to the care of the teeth. We impress upon the mother the importance of leaving the temporary teeth in the mouth until the permanent teeth come to take their place. There is no exact age for the child to shed such-and-such a tooth; the time to shed it is when another tooth comes in to take its place. In this particular case here we see that the tooth was taken out too early. The jaw has shrunk; the gap has closed up. The permanent cuspid is lying right here, and when it comes through it will certainly be out of line. The shape of that child's mouth has been destroyed, and there is no way to correct that except by orthodontics. Now, of course public health men are not going to talk orthodontics, because to correct a thing of that kind will cost around $500.

(Slide.) Here is a cuspid tooth out there too early. You see the spacing in the front teeth there and in the lateral, the whole business driven back to the right. The reason I am showing two models of cuspids is that this error is seen so often. The big majority of all irregularities are caused by taking out the baby teeth too early.

(Slide.) Here is a mouth that is pretty well shot up so far as regularity is concerned. There are two or three things that could cause that. One is adenoids and tonsils. In this particular case that is what I should say caused it. Thumbsucking could have caused it but did not in this case.

(Slide.) That gap there is so small you can not put the lead of a pencil through it. The cuspid tooth is supposed to come in that gap. You know it can not, so there is bound to be an irregularity. That child's facial outline is badly distorted, and there is no way to correct it except by orthodontics.

(Slide.) This little arch here is in bad condition from decay, and the reason for the decay is the lack of lime in the diet of the mother. These teeth came through with the enamel not properly calcified. Calcification takes place under the gum; it does not take place after the tooth is exposed. Two months before normal delivery, or when the fetus is about seven months old, the enamel caps of all these twenty teeth are completely formed. There is nothing but the enamel cap and epithelial tissue. Now, anything that affects the skin affects epithelial tissue, and will affect the teeth. That is why we so often see these little pitted teeth. If we ask the mother if the child did not have measles or scarlet fever or something like that at about three years of age, she will say yes. The enamel is the epithelial tissue calcified, the only part of the body where it is calcified. Calcification takes place under the gum. Now, it is almost impossible to make a cavity deep enough so as to make the filling stay. If you make the cavity too deep you get too close to the nerve and cause the nerve to die. We don't do that any more.

(Slide.) This shows what we call the Arthur method for treating the teeth. We take a chisel and cut a V to the gum line and introduce nitrate of silver. Now, the nitrate of silver stops the decay if we get a good reduction. It will have to be repeated in about six months, because the child chews with these teeth and it wears away. It should be repeated, because it preserves the teeth and you can let them stay in.

(Slide.) The nerve is out of that tooth, but there is no pus around the tooth. We do not take out a tooth unless there is pus. We drain it out, if we can; we drain out the pus and introduce nitrate of silver. Of course, that leaves a socket there that food will pack in, and we have to caution the mother to see that that is cleaned out.

(Slide.) Six-year molars come in before the child sheds a tooth. This model shows all the baby teeth in place. There is not a cavity in the mouth at all. The six-year molars are in place. This child is seven years of age. This tooth here is ready to come out.

This next slide shows an unusual case. There are six teeth between the cuspids in this little fellow's arch. That shows that we must have an x-ray to do intelligent dentistry for a child. When we saw six teeth between the cuspids, when ordinarily there are only four, we wondered whether there would be six in the next set, and we made an x-ray and found there were. When those teeth come down we will take out the extra two, because there are four below and six above, which would make the arch irregular. The gap will close.

(Slide.) Here is a three-year-old mouth with an irregularity. This particular case the mother can correct herself. It is as easy as can be, but if she lets it go on it will be an awful condition. The mother, just by putting her finger under these two teeth, can lean them out; and if she will do that several times a day the mouth will become normal. Of course, then the permanent teeth will be normal, too.

(Slide.) A five-year-old child. I wanted to show the contrast here. Here is what I want you to notice. See the spaces between the teeth. That is normal, because this jaw is expanded. In the three-year-old mouth those teeth were close together. After two years you see the same teeth with the spacing between. That shows how the jaw has expanded. At seven years there will be still more space. A great big tooth is going to take its place.

(Slide.) This is one of the schools. The reason I am showing this is that it is one that we can get hold of regularly. This is a mill school, and the nurse brings the children. In that way we can get them regularly. We have reduced the fillings required, in four years' time, from one filling to every two children until last time there were 87 children there and only five permanent fillings to go in.

(Slide.) This is one of the prettiest mouths I ever saw. I do not hesitate to say that. We had her open her mouth so you could see the teeth a little better. The occlusion is perfect. That child three years ago had $22 worth of work done on her mouth. Among other things, five permanent teeth were filled and nerves capped. There is a perfect mouth now. Nothing in the world she could put around her neck in the way of diamonds or pearls or beads could be half as pretty as that mouth. We tell the children that other things can be bought, but teeth have to be made, and it takes years to make them.

DISCUSSION

Dr. A. C. Bulla, Health Officer, Raleigh and Wake County: Dr. Branch has been associated with the Wake County Health Department for nearly four years and the work done speaks for itself. I feel that you cannot appreciate what can actually be accomplished by a whole-time dentist for a county nor can you glimpse its value without becoming closely associated with the work. There is much to be done besides dentistry. The mothers are to be taught and they are to be made to understand, and with the teaching of the dentist and the understanding of the mothers we are building up the foundation of dentistry in Wake County as well as greatly aiding in the basic principles of right living, health understanding and long life. The members of the Wake County Board of Health are enthusiastic about our dental work. It would be one of the last branches of our work which would be discontinued under reduced appropriations. To give you some idea of the public's appreciation, we, a short time ago, sent a form letter to the city schools to be distributed by the teachers to pupils and asked that they be filled in and returned. This was done that we might have applications for work during the summer months. From three schools we got 1200 applications for dental work. From two of the schools we got about 90 per cent of pupils within the age limit and from the third school only about 40 per cent of pupils within the age limit. This I feel was a test of how the public feels about our dental office and dental work. In dollars and cents the dental office is paying a big dividend, but when this is compared with its educational value, it is insignificant.

Dr. F. R. Harris, Henderson: We have a whole-time dentist in my county that we have had for several years, and that is one of the most

popular things we have. The people appreciate it, and they keep him busy. Dental work, as Dr. Bulla has said, proves to be the most popular side of the work, and I am certainly proud to have it in my county.

Dr. F. C. Johnson, Supervisor of Dentists, Bureau of Medical Inspection of Schools, State Board of Health, Raleigh: I think one of the greatest crimes committed in our country is early extraction of the temporary teeth. A great many country physicians carry forceps with them and extract teeth, and often before they should be removed. Also a great many dentists extract too early. Naturally that causes malocclusion, subsequently resulting in decayed teeth, and run-down anemic conditions. Dr. Branch certainly brought out all of this well. I should just like to state that we can not understand why more mouth hygiene is not taught in the public schools. The children get very little of it. I happened to be in a mountain school several years ago where there were about 150 children, and several teachers, all college graduates. Only three of the 150 children were using toothbrushes. Who was to blame for it? We can not blame the parents, for most of those children came from back in the mountains. Those teachers should have taught the children the essentials of mouth hygiene.

Dr. K. E. Miller, United States Public Health Service, New Orleans: Not being a dentist, I want to ask a question. I was impressed by what Dr. Branch said about leaving the temporary teeth in until they are ready to come out. The question I want to ask is, Can the temporary teeth be left in too long? Just what is the criterion as to when the temporary teeth should come out?

Dr. Branch (closing the discussion): One question, I believe, was as to how to get children to the dentist. The first thing you must do is to reach the teacher. You can not depend upon reaching the mother; we must reach the teacher. The child will often listen to someone else when it will not listen to the mother. One of the great responsibilities of the whole thing rests on the teacher, and she has to be sold to the idea in order to get results. If we get the teacher, then we get the child; and if we get the child we get the parent. We not only get the child to the clinic, but get the adults to their dentists.

As to Dr. Miller's question, it is true that it is possible to leave the temporary teeth in too long. The time to take out a temporary tooth is when the permanent tooth is ready to come in. I think the question he wanted to ask is, why does a permanent tooth come over the temporary tooth, or inside the temporary tooth? The reason for that is that when the little fellow is crawling about on the floor, at the age when these permanent teeth are developing, very often he hits his mouth that we know about, and more often that we do not know about. He always hits the lower teeth from the outside, and knocks the temporary tooth off center, and the permanent tooth will come on the lingual side of the temporary tooth.

MUNICIPAL MEAT INSPECTION

William Moore, D.V.S., State Veterinarian, Raleigh

The first legislation providing for Federal meat inspection was passed by Congress in 1890. This was a feeble attempt to satisfy appeals of livestock interests and packers for a service that would inspect and

certify to foreign governments the healthfulness of our animals and the wholesomeness of our meats. This law was ineffective, and in 1891 Congress enacted a law of sufficient force and breadth to command the confidence of European purchasers. Meat inspection is a service in hygiene and sanitation primarily, but the arguments which moved Congress were based wholly on economic considerations. Many European countries had issued orders prohibiting meat and meat products being imported from this country, and without a proper meat inspection service our export trade would have been cut off and the livestock and packing industry paralyzed.

Much progress was made under these laws and sufficient sentiment was created to have Congress enact the present Meat Inspection Law, which was passed in 1906. This law provided for the ante-mortem, post-mortem and sanitary inspection of meat and meat products shipped in interstate or foreign commerce. The enforcement of this law is under the B. A. I. of the U. S. Department of Agriculture. The present meat inspection regulations of the B. A. I. embody the most complete and comprehensive set of meat inspection regulations ever prepared and published in the English language. It should be noted that the Federal Law and Regulations apply only to meat shipped interstate or exported. It is estimated that about 65 per cent of the meat supply of the United States comes under Federal inspection, leaving 35 per cent that is slaughtered locally or within the states and subject to state laws and regulations. In North Carolina prior to 1925 no state-wide attempt had been made to regulate the industry. Regulation under the general law was left to the several boards of health of the cities, towns and counties, and in some instances a satisfactory system of meat inspection was maintained.

The disease control and eradication work of the Department of Agriculture brought us in rather intimate contact with the slaughtering establishments throughout the state. In many locations no inspection or inadequate inspection was maintained, and there was lack of uniformity in the regulations covering. As a result of this, one city would not or could not recognize the inspection of another city. The department believed that uniform inspection throughout the state would result in increased consumption of meat and meat products, just as inspection of dairies had increased the consumption of milk and milk products. It was also believed that there should be uniformity in the law and regulations and that the department should give general veterinary supervision to such inspection, leaving the details to the local health department. The General Assembly of 1925 enacted a law providing for such supervision and giving the Commissioner of Agriculture authority to issue meat inspection regulations. This law is not compulsory, but permits slaughtering establishments which meet the requirements of the law and regulations to operate under state supervision and to dispose of their meat and meat products anywhere in the state without further inspection. It was not believed advisable to make this law compulsory in the beginning, since it was new legislation and the department did not have the funds or machinery to carry this into effect.

In September, 1925, the Commissioner of Agriculture issued meat inspection regulations in accordance with the Meat Inspection Act. In preparing these regulations the Federal regulations were followed very closely because it was known that the Federal regulations were based on 20 years of experience and were the last word in such regulations.

If the inspection is conducted by a capable veterinary inspector and these regulations are followed, a healthful and wholesome meat supply may be expected. We believe that it is essential to have a veterinarian make the inspections. I know of no work that requires a more complete knowledge of veterinary medicine than that of meat inspection. To pass for food meats that should be condemned is unfair to the public, and to condemn meats that should be passed for food is unfair to the owner and an economic waste. It would seem more advisable not to maintain inspection at all than to maintain inadequate inspection, because the latter gives the general public a false security.

Since there is only one slaughtering establishment within the state operating under Federal supervision, we had hoped that many of our local establishments would operate under this law. To date there are six plants operating under it. I believe that this is a matter that every health officer should give serious consideration, since a wholesome meat supply is essential to the health of a community.

DISCUSSION

Dr. A. H. Kerr, D.V.M., Goldsboro: We have all heard of the superstitions that exist in negroes and white people, some ignorant and illiterate, some educated, and some supposedly intelligent. For instance, one of the dairymen in our county was approached to know if he had a completely black cow. He said he did not, and asked what was wanted with the milk from a completely black cow. "Why, mister," his questioner replied, "that is the very best medicine on earth for rheumatism." (Laughter.) At another time a midwife who had attended more births than any one physician in our county approached a man who operated a truck farm and said, "Mr. Jones, I want you to see if you can not persuade those negroes down there to buy some pole beans for that crooked-shanked boy of theirs, so he will straighten out." Just such things we run into when we try to apply the regulations of which Dr. Moore has spoken.

I am going to give you a few facts that will make you either want or not want meat in some localities. There is a man who lives in a very out-of-the-way territory in eastern North Carolina, whose business is going to the larger towns in the eastern part of the state and buying calves that the dairymen have practically killed with the milk bucket. He does not knock them in the head with it, but, finding that milk has a greater market value than meat, he practically starves them. This man takes them home, sometimes a dozen at a time, and feeds them on anything he has. Very often they come down with scours or something else. When he realizes they are going to die, he kills them, and sells them to anyone who will buy. He brought five calves to the town of Goldsboro. The local butcher, thinking he wanted to know more about those calves before buying them, had me called up. When I got

there I was instructed not to tell who I was. I talked with him, and asked him about the calves, where he got them, etc. Finally I described to him a picture typical of peritonitis. His mouth dropped open, and he said, "How did you know?" That calf had had peritonitis. Could it have been possible for the calf to have existed, every portion of its intestines would have been fastened by adhesions to the flank. He said, "Let me go; I can sell them elsewhere." I asked what he did with those calves, and he said, "Those old veal calves make the best pork sausage you ever ate."

Another case. I arrived just in time to hear these words: "Dear, you had better kill her, if not she is going to die." "What shall I do with her after I kill her?" "Why, you can sell her." "Now, you know I would not eat that meat." "But you will not have to if you sell her." Now, that cow had septic vaginitis, with a terribly offensive discharge. I found she had a temperature of 107. Do you suppose that meat was wholesome?

Last year, in unloading livestock for the fair, there was a very large hog. In unloading the gangway broke, and likewise broke her back and two legs. They kept her long enough to get her entered, and the judges gave her first premium. They were not all lay folks; two were agricultural college graduates. Pretty soon I came by. I asked, "How did you get your hog hurt?" He said, "How do you know it is hurt?" Well, it is because I have been trained in this work. We are trained by being required to do some of these things; then are required to go to a packing house and observe them.

We are asked why all this attention and time for meat inspection. Just a few days ago a car of hogs arrived at Goldsboro. The local veterinarian was called to give a certificate to the railroad company that the hogs were in good condition. The agent said to the veterinarian, "Give us a certificate so we can deliver these hogs." He said, "Just a minute," and he took his thermometer and took the temperatures of about ten or twenty per cent of the hogs, finding them to have 103, etc. He said, "I cannot give you a certificate." "What is the matter?" was asked. "I don't know what is the matter, but they have a high temperature" The next morning he found eight or ten dead, and several more nearly dead. The agent wanted him to allow them to go to a local packing house, but he said no; then they wanted him to release them then and there. He said, "What will you do with them?" "I will ship them to Richmond." "How do you know you can?" I sent five cars several days ago. Eight in one car were dead when they got there." "What do they do with them?" "Make sausage out of them." Not in United States inspection.

Several days ago I went into a local butcher's shop, and saw a man wrapping up a soup bone. Now, I stamp the shank in two places, on the carcass and on the shank bone, which is the last piece the butcher sells. This bone was not stamped. I said: "Hold on a minute. Where did that meat come from?" He began making excuses. I found out that this meat came from a neighboring county, and had been killed as a tubercular reactor. And right in the joint I found a lesion. He said, "Oh, well, that will be all right when it is cooked." Well, maybe, but I do not believe we should eat it.

Now, why am I telling you some of these experiences? To impress you with the fact that any locality that will put up the necessary backing will protect not only its own community, but neighboring communities. I find that meat put up in Goldsboro is sold as far west as Raleigh, as far north as Rocky Mount, as far east as New Bern. But should Goldsboro be called upon to furnish protection to all those communities? No. We should have state-wide meat inspection. How do we eliminate tuberculosis in cows? It is done with state, United States Department, and county funds jointly. How many veterinarians are there in North Carolina? Just a few, in proportion to the entire population. How many medical practitioners in North Carolina? Just a few, in proportion to the entire population. What is the principle of our government? That when the activities of any individual or group of individuals become a menace to the whole population, then the government should enter in and cause those activities to cease. Therefore I say that no veterinarian, no group of men, should be allowed to be a menace to the whole population. Since the agricultural department has gone in and eliminated the breeding place for tuberculosis in the human, shall we stop there? How did they do it? By finding and destroying the old cow infected with tuberculosis. Some of you say you do not believe the infection can be conveyed in that way, but I can take you to several families that we believe, as positively as we can believe anything in the world, were infected by milk. We can do it, but how? Never, until the North Carolina State Board of Agriculture says, "It is your job; carry it on." Not until the North Carolina Public Health Association says, "It is your job; carry it on." What is the sense of inspecting dairies and killing the infected cows when a man with tuberculosis can milk his old family cow and peddle that milk around? What is the use of having meat inspection when the man with tuberculosis or syphilis or gonorrhea can kill his beef cattle and take the meat in and have it passed? We have to get on a uniform basis. Let's get behind this thing and carry it through. The United States Department of Agriculture's Bureau of Animal Industry handles all interstate shipped meats and the state should take care of intrastate meats and foods.

Dr. Moore (closing the discussion): I have nothing further to say. As I said in my paper, the department I represent, the Department of Agriculture, is chiefly interested in this because it is an economic problem. We have drafted regulations, and would like to have a committee appointed by this association to go over them, or have the officers go over them, and tell us what they think of them. I will leave a copy here.

APPOINTMENT OF COMMITTEE

Dr. E. R. Hardin, Vice-President, appointed the following as committee on the president's address: Drs. J. A. Morris and M. L. Townsend.

A CO-ORDINATED NURSING SERVICE

C. C. Hudson, M.D., City Health Officer, Greensboro

The public health nurse, working with a public spirited, capable physician, constitutes our most valuable unit in the public health field

for preventing disease, teaching positive health and caring for those who have developed disease in spite of central efforts. Without the physician her efforts are only partially successful. On the other hand, a physician in the public health field who does not have adequate nursing assistance cannot make a complete success of his work.

All health workers realize that best results are secured by personal contact. Newspaper publicity, the movies, literature, and public addresses help to create a favorable public sentiment in which to work. The real work of any organization must be done by going out into the byways and searching out those who do not have protective measures thrown about them, and bringing to such the personal touch. In the home, the school, the industrial plant, the health center, the conference, the well trained nurse brings just the personal touch necessary to secure results. The public health nurse must first be a real teacher. Unless she is one she would be better off in the private field.

Realizing the value of a strong nursing organization, one of the first problems in building any health organization should be to build a nursing organization which would fulfill the following requirements: (1) Sufficient force to care for the nursing needs of the city; (2) capable of expanding, so as to keep up with the city's growth; (3) have nurses sufficiently trained and supervised to care for their work properly; (4) provide good working conditions and salaries for our personnel, so as to uphold a good morale in our force.

In the development of our nursing organization in Greensboro we have not attempted to even approach the standard of one nurse per 1,000 population set by our national organization. We have, however, tried to improve our nursing situation without increasing our nursing cost to the point where it would finally embarrass other parts of our health program.

Two years ago we had the following rather disjointed nursing situation.

City Health Department: (1) One nurse, acting as part supervisor of school nurses, part office, and part school nurse; (2) one nurse, infant welfare work; (3) four nurses, city schools; (4) two nurses, county schools—all school nurses working out from Health Department; (5) one tuberculosis nurse (undergraduate); (6) one nurse full-time, one nurse about half-time employed by the Metropolitan Life Insurance Company; (7) one nurse, Church of the Covenant; (8) three mill nurses (the Cone mills).

As Greensboro has a population of 48,000, we felt that if this nursing work could be coördinated it would give a fair nursing force, and if we could secure two or three additional nurses that we would be able to try out our work on a generalized basis, each nurse caring for all the nursing in her district with the exception of a delivery service.

After considerable work an organization, named the Greensboro Nursing Council, was formed, composed of representatives from various organizations in Greensboro, and after some delay, this organization began taking over the nursing work, the Health Department furnishing the supervising nurse, office space and one other nurse, the va-

rious organizations continuing to care for the salaries of the other nurses. The Cone mills refused to participate in the organization. The Church of the Covenant continued its nurse separately.

The Community Chest made an appropriation of $3,800 to the nursing work and this enabled us to employ a clerk and an additional nurse, giving us a force of seven white and four colored nurses, one supervisor and one clerk for a population of 36,000 people. As a rather large proportion of this population is made up of people able to employ nurses when ill, we felt that this force would be fairly adequate for the first year, the city to be divided into eleven districts, and each nurse doing everything in her district with the exception of caring for delivery. We hope later to add this service to our routine.

An allowance of $25.00 per month for automobile upkeep was made and most of our white nurses purchased cars for use in their districts.

Rules governing the conduct of the nursing activities and record forms were prepared and the organization began taking over the nursing work the first of June, 1925. The full nursing force was not completed, however, until the middle of September, and the clerk was later added to the force. Since that time the nurses have all been doing visiting nursing on a generalized plan, with the following results:

VISITS TO PATIENTS BY NURSES

Cause of Visit	*Bedside care*	*Instructive*	
Acute—Medical	4091	417	
Communicable	1047	1917	
Surgical	75	21	
Chronic Cases	195	34	
Maternity—Prenatal	16	756	
Eye	19	4	
Postpartum	1220	114	
New-born	1049	45	
Child Welfare—Infant	154	4480	
Child	50	83	
School	43	2005	
Venereal	4	4	
Tuberculosis	120	619	
	8083	10499	
Total visits to patients			18,582
Visits on behalf of patients			610
Total visits			19,192

The table above shows the nursing services which we offer. Nurses do not visit scarlet fever cases, but take release cultures for diphtheria. All first visits to diphtheria and typhoid cases are made by the health officer. Smallpox cases are cared for by the health officer. The nurses care for the quarantine, nursing, etc., of other communicable diseases, excepting when there is doubt as to a diagnosis, or where a family has had no physician, then the health officer may be called for diagnosis. We hope to be able to develop our prenatal work during the coming year,

especially for that part of our cases now handled by midwives, and we also hope to be able to begin to assist physicians with home deliveries, a work which is badly needed.

Each nurse carries out her work according to a definite plan. All calls come to a central office where the clerk and supervising nurse arrange them by districts. The nurses call the office at regular hours—this being, as a rule, while they are at the schools in the morning and after lunch. They also have regular time for reporting at the office and turning in records of their work. Each nurse has a small record book in which she keeps calls arranged by streets. Each nurse will have, say, five to ten tuberculosis cases, thirty to forty babies, prenatal cases, school children having defects, etc., all arranged in this book. When she goes to a home to give bedside care she may find that she has a child in the home who needs an eye defect corrected, and while she bathes the mother she can be talking about Johnny's eyes. There may also be a baby in the home who is not being fed properly, and thus she establishes a personal contact with the mother, who is glad to have her return to weigh the baby. As soon as she has finished with this home she may have an instructive visit next door where the neighbor is glad to see her, and in the meantime the nurse gives the necessary instructions in regard to John's tonsils being removed. When the nurse is not busy giving bedside care or quarantining cases she does regular follow-up of the babies, tuberculous cases, prenatal cases, etc.

In conducting a coördinated nursing work, on a generalized plan, it is very necessary that accurate records be kept of all work done by the nurses, including the time spent on each part of the work. All our school records are kept on file in the schools. We use the regular State Health Department cards for this purpose. We have a small record file for contagious diseases, a special report card for Metropolitan cases and a family folder for our bedside cases. Each nurse has a daily record sheet which is summarized each month. The clerk does most of the clerical work and copies the nurses' reports for filing in the family folders.

HOURS SPENT ON NURSING ACTIVITIES

	Hours	*Min.*
Bedside nursing	4359	40
Instructive calls	2760	10
Travel time	4805	5
Clinics	399	0
School work	7202	0
Supervision	390	20
Assigned duties	4271	50
Other activities	268	30
Total hours	24,456	35
To pay working call	.5393 hour	
To pay instructive call	.3054 hour	
Travel time between calls	.2504 hour	

Having various organizations with which to deal, it is very necessary that our records show just how much time we spend on different work

and also the visits which we pay in rendering that service. This, of course, can be approximated when we know how long it takes to pay an average visit.

VISITS FOR EACH ORGANIZATION

Health Department	7,744
City and County School Boards	2,071
Community Chest	4,555
Metropolitan Life Insurance Co.	4,059
District Nurse and Relief Committee	763
Total visits	19,192

FINANCIAL SUMMARY

	Hours	*Appropriation*	*Card for hours*
Health Department	5949	$4772.	0.802
City and County School Boards	8901	7487.	0.841
Community Chest and Fees	5761	4750.	0.824
Metropolitan Life Ins. Co.	3305	2200.	0.665
District Nurse and Relief Com.	540	800.	1.48
Total	24456	$20,169.	0.825

CONCLUSIONS

From observation of our work during the past year I would draw the following conclusions:

1. The coördination of the nursing activities of several organizations in a city of 50,000 is practical provided the following conditions are observed: (a) Due credit is given each organization for its part of the work. (b) Accurate records are kept so as to show what is done along each line and the time spent on each activity. (c) Reports are made to the various organizations showing what they are getting for their money so that it may be given publicity. (d) A capable, tactful supervising nurse is provided to direct the nursing activities and to deal with the various committees.

2. A coördinated organization provides a working place for those who are interested in public health.

3. If the interest of influential people is secured it gives strong support to the public health movement.

4. It provides an organization to secure adequate funds for nursing needs.

5. An organization can handle work which would be very difficult to handle through a health department.

6. The generalized plan of nursing work is both economical and practical, each nurse doing all the nursing work in her district.

DISCUSSION

Dr. R. L. Carlton, City Health Officer, Winston-Salem: Dr. Hudson is to be congratulated upon this paper, upon the amount of work he has put on it, and upon the public health nursing program he is putting over in Greensboro. It is a very excellent program. I congratulate him

upon his coördination of the work and upon his generalized program. We have put in force such a scheme in Winston-Salem, except that we have no Metropolitan nurse working under the health department. I believe generalized nursing is to be preferred to specialized nursing, although there is something to be said on the other side.

Dr. John H. Hamilton, Wilmington: I also wish to congratulate Dr. Hudson upon the amount of statistical work he has put in his paper, and also to say something about the so-called Dayton plan. I happen to have worked with both schemes, and I can not keep from feeling that where two or more nurses go into one home there might be friction, whereas there is harmony under the district plan, or Dayton plan. It enables you to get more work done when you can coördinate your activities and get outside capital interested in the work.

AFTERNOON SESSION

Dr. John H. Hamilton moved that the secretary be instructed to send a telegram to Dr. W. S. Rankin, director of the Hospital and Orphan Section, Duke Endowment, expressing the regret of the North Carolina Public Health Association at his injury, and conveying their best wishes for his speedy recovery. Motion seconded by Dr. L. W. Corbett, Goldsboro. Dr. C. W. Armstrong offered an amendment referring the matter to the committee on resolutions, seconded by Dr. C. L. Outland, and this amendment was accepted by Dr. Hamilton, and the amended motion was carried.

SANITARY, HYGIENIC, AND HUMANE CARE OF PRISONERS

L. G. Whitley, Chief Sanitary Inspector, Bureau of Engineering and Inspection, State Board of Health.

As we scan through the pages of the history of this world there appear many periods which seem marked with distinct and central problems or achievements, as if to each such time there had been committed a special work to do. Their characteristics stand out clearly against the past as a distant range of mountains stands out against an evening sky. We speak with confidence of the mission of Greece to civilization, of Rome in history, of the vocation of the Hebrew, of the period of reformation, of the epoch of Napoleon's conquests, of the reward to the medical profession during the era of Lister, Koch and Louis Pasteur. By one lesson at a time—through types of beauty or strength or righteousness, or through warning of the lust for power and destruction of civil rights, or through intellectual understanding or natural affection—the Master of the ages seems to have directed the education of the human race.

Sometimes the mission of an age or race is recognized by those who are fulfilling it; the health officer conceives of the effects of public health work. Sometimes it is discerned by those who stand at a distance, where the crowded details of life melt into a general view. It is the felt need and conviction of the mission of the age that urges forward with force and weight those that are commissioned with the exercise of some duty for the welfare of the race. The Hebrews were sustained throughout their history by the conviction of their sacred call-

ing, and that conviction gave to their career its sombre, strenuous, self examining character; in Greek life it was the opposite, it was the very unconsciousness of a didactic mission which made possible the prevailing serenity and charm. If Greek art had stood consciously before the glass of the future, it might have been the teacher, but could not have been the joy of the world.

We are living in an age that belongs without question to the former class. There is not only given to it a mission but there is added consciousness of that mission. We do not have to wait for the philosophical historian of some remote future to discern the characteristic problem of today. For behind all the extraordinary achievements of modern civilization, its wonderful transformations of business methods, its miracles of scientific discovery, its mighty combination of political powers, there lies at the heart of the present time a burdening sense of maladjustment which creates what is called the social question. "The social question," remarks Professor Wagner, "comes of the consciousness of a contradiction between economic development and the social idea of liberty and equality, which is being realized, particularly in political life." That is what gives its fundamental character to the present age. The consciousness of a contradiction between economic progress and the uplifting ideas may use the language of social philosophy, or may take the form of a social reform service or may be organized in social legislation, or may utter itself in the passionate cry of indignation or hate which comes from the despairing or from those who sympathize with them. In all these varied and often unreasonable or extravagant ways the characteristic emotion of the time expresses itself. It is the age of the *social question.* Never were so many people, philosophers and agitators, men and women so stirred by this recognition of inequality in social opportunity by their dreams of a better world to live in. Every person seems to have a panacea for the world's social disorder. One of the foremost observants of the American economist has remarked, "When I hear any one bring forward a solution of the social question, I move to adjourn." There is, he means to say, no such thing as the complete and immediate solution of the special problems which are inextricably involved in the general progress of the social evolution at this time.

The mayor of Boston points out that playgrounds will offset penal institutions, and gymnastics may reduce the expenditures for prisons, so that it may be even urged that "Crime in our large cities is to a great extent simply a question of athletics."

Carl Christian Jensen, May issue of *The Atlantic Monthly,* remarks, "Our abolitionist friends told us years ago that slavery was wrong because the slave, a human being, had been deprived of his free will. Hence, slavery was abolished. Our scientific friend of the mechanistic era tells us that punishment of a prisoner is wrong because the offender never was endowed with a free will, and therefore cannot justly be held responsible for his evil doings.

A very old supervisor in a convict camp says he has burned the back of many a negro in his day. They are perverts and degenerates. The lash cures that! And then he quoted the Bible to clinch his dogmatizing.

The work of the health officer among prisoners is a correlation of the social question among that class and gives to the scattered movements of social reform a unity and interdependence so vast and complex that one must dismiss the notion of a panacea for each social ill, and content himself with an imperfect and contributory service. As a rule the question of approaching criticism usually arises whenever a movement is made to bring from bad to good; therefore reform work among prisoners seems to have a dual nature. It is damn if you do, and damn if you don't.

The Durham *Herald* remarks, "The United States is a murderous and robbing nation and North Carolina is a murderous and robbing state." "We are very much wrought up," it continues, "when the State takes a life." Some time ago we saw a cartoon in which the criminal was pictured as sitting back in a chair, legs crossed, smoking a cigarette, and basking in the limelight of publicity by sentimentalists. The sob sisters, the board of pardons, the welfare workers, and the whole gang were hero-worshipping the criminal, while on the outside was a battered figure, representing the people, asking of a policeman when he was going to receive protection from the criminal.

There is much said about the tendency to pour out too much sympathy on the criminal and forget about the wrong sustained by the innocent. They say the criminal robs and murders and is swamped with sympathy, while the widow and orphan has been robbed and forgotten. Their loss through no fault of their own is ignored. This is the kind of emotion that excites feeling, that sets up barricades between bad prison conditions and prison reform management. However, that is neither here nor there, for the issue regarding prison management before the county health officer or physician in charge of the medical care for prisoners is the question of duty. In that connection the State Board of Health has been designated by the General Assembly of North Carolina to prescribe such rules and regulations as are necessary for the sanitary and hygienic management of prison camps and jails, which it has done. This authority, however, does not conclude the limit for ascribing the duty of county health officers or physicians in charge of prisons. The General Assembly of North Carolina enacted Bill 262, Public Laws of 1917:

"Section 4. It shall be the duty of every county physician or city physician or county health officer or city health officer, or other physician having in charge the medical care of prisoners in any city or county in this State, or on any public or private works where prisoners or convicts are employed, to make a thorough physical examination of every prisoner committed to the county or city jail or to the county or city chaingang or road force, or any public or private works, within forty-eight hours after the admission of such prisoner."

"Section 8. That any person violating any of the provisions of this act shall be guilty of a misdemeanor, and fined or imprisoned, in the discretion of the court."

Admitting a person is a prisoner, yet he has a right for some consideration in the name of equity. When a prisoner is locked up he does not make application for his cell but is assigned to it by the officer; therefore, he is entitled to clean sanitary quarters, a place to sleep, wholesome food, clean water to drink, clothes to wear and medical care.

The physical condition of a prisoner should be as accurately determined as it is possible in order that the superintendent may assign such labor as he can accomplish.

Let me read the report according to the unprejudiced testimony of sixty-five prominent medical men who, under the direction of a past president of a state medical association, recently examined 3800 men and women prisoners; 891 were found suffering from syphilis, 122 from tuberculosis, 421 from diseases and severe defects of the eyes, 112 from disease enough to cause blindness unless properly treated, 365 from gastro-intestinal diseases, 10 from intestinal ulcer, 27 from appendicitis, 1,477 from diseases of the nose and throat, and 2,847 from diseases and defects of the mouth, teeth, and gums. And the report concludes saying these are not all the figures.

DISCUSSION

Dr. D. E. Ford, New Bern: We all must recognize Mr. Whitley's position as being sandwiched between the public health and welfare departments, and that when he comes in to criticize our camps he has certain regulations he has to put through about sheets, pillow cases, etc. Sheets must be of a certain length, etc. The men must have games! I always welcome him, because he sees things from a practical point of view. He helps me to get results. He can see the humorous side and the serious side, too. I want to say for Mr. Whitley that I welcome him, and I believe we all ought to indorse his work.

Dr. L. Jack Smith, City and County Health Officer, Wilson: I should like to say this for Mr. Whitley personally, though I am not going to discuss his paper. I have known him now for about eight years; he has worked in my department, and we are good friends. We live in the same town. I want to say for him that he is absolutely conscientious, he is practical, and he will help you if you will let him. I hope that every health officer here will receive him and assist in this problem of prison reform in the best spirit. I commend him to you.

Dr. C. C. Hudson, City Health Officer, Greensboro: I want to say just a word in commendation of this new effort of the State Board of Health in promoting prison sanitation. I think the State Board of Health has now gotten on the right track in improving conditions in the prison camps. There is no question but that this is necessary work, and that as now being conducted it is on a very high plane. In Greensboro we have been able to care for our problem in a fairly satisfactory manner. We have only a small camp for negroes, fifteen or twenty, to care for.

I think if we receive Mr. Whitley as someone who will be of assistance to us, rather than as an inspector, we shall be on the way to solving our problems, and I want to commend this effort of the State Board of Health as it is being carried on at the present time.

Dr. S. E. Buchanan, Health Officer Cabarrus County, Concord: There is one question I want to ask the health officers. How many vaccinate your thirty-day men for smallpox?

Dr. C. L. Outland, Health Officer Pitt County, Greenville: In our county we vaccinate every man on the day he comes into the jail, whether he is there for thirty days or five years. I do not take the time to figure out how long they are going to be there. If you should have a few cases of smallpox in your camp, you would always vaccinate after that.

Mr. H. E. Miller, Director Bureau of Engineering and Inspection, State Board of Health, Raleigh: With regard to the question of vaccination, a new regulation has been considered by the State Board of Health, and we expect the Board to take final action at this meeting. The question of vaccination was the only one that was a matter at issue. There are two phases of the thing to consider. One is the health officer's problem in vaccinating prisoners, for they come in and go out at such irregular intervals. The state or county, however, takes the responsibility for the prisoner's life and welfare in a prison camp or jail, and in doing so must provide the prisoner health protection equivalent to that recommended for the free citizen. The other side of the question is the practical side of it, the economic situation, and in considering this matter the Board has tried to be fair and practical in its rules. In disposing of the question of vaccination it has tried to be safe, and yet impose no undue inconvenience for the health officer and impose no undue economic liability on the county. It is recognized that if a prisoner is vaccinated as soon as he enters the camp, and is to serve only thirty days, the chances are that he will have a sore arm during the whole thirty days and will be a liability to the county and will be a nuisance and source of discontent. The regulation requires that all prisoners, regardless of their length of confinement, shall be vaccinated within thirty days. If the prisoner is a thirty-day prisoner, he can be vaccinated at any time within that thirty days, according to the health officer's convenience and judgment. The health officer can vaccinate him on the last day, if he sees fit, so that the prisoner will not be laid up with a sore arm and be a burden upon the county.

Mr. Whitley (closing the discussion): We need to help those in charge of the prison camps, if the management is to improve. This was a very plain conclusion to me after I had been engaged in this work a short while. There are two ways of doing it. One is by the process of elimination of those in charge who are incompetent, incapable and inefficient to manage a camp: the other is by the way of instructing and helping those managing the camps. The process of elimination is very slow and frail, because prison officials are appointed by the successful candidates elected to office by the political party in power. Whenever a small ground of complaint is made against a prison official this gives cause for a political row to loom up and nothing good comes out of it. Therefore, we need not expect any appreciable improvements made by the process of elimination at the present time. We shall therefore, have to give our attention to the latter way. A great many of these men in charge of a camp don't know what sani-

tation means. If you visit their homes you will find them insanitary and not clean. We can help them in locating sites for the camps, we can help them with the camp's water supply, the selecting of a balanced food, the exclusion as far as possible of the fly nuisance and the suggestion for properly cooked food. One county in western North Carolina hires a man to do the cooking for its prison camp, who knows how to cook food and save it. They say he saves enough to pay his salary and has never been known to have a prisoner sick by eating poorly cooked food. Then there is the proposition of bathing the prisoners and the matter of sewage disposal, both of which are grossly neglected in most of the prison camps. These are matters which very few men in charge of prison camps give any attention, notwithstanding their place as a health problem. Then there is the clothing for prisoners. I was in a camp last winter where the prisoners had no underclothing, while the guards were going around in heavy overcoats. As soon as I called this to the attention of the commissioners, they got some underclothing for the prisoners.

I have found in general a coöperative attitude from the prison officials and most of them are open for suggestions for improving the camps.

PROTECTING OUR GREATEST ASSET

A. C. Bulla, M.D., City and County Health Officer, Raleigh.

When I was asked to write this paper and the subject was suggested, I hesitated for a moment, and while in that subconscious state of hesitation, my mind traveled at once to the boundaries of the state as ripples of water travel from the center of a pond to its edges, and I saw in a quick mental review between 80,000 and 90,000 expectant mothers going through the critical period of gestation, attended by many dangers, that leads to motherhood, looking to the future, as heroines of old when they would go down to the very brink of the valley of the shadow of death to fulfill their highest function in life. I saw 7,226 infants under one year of age scattered over this great and prosperous state, dying most of them from preventable causes. I saw 2,362 children added to this number before they reached their fifth birthday. And then I saw between 300,000 and 400,000 parents laboring with all their might and skill and knowledge trying to create out of either their simple or luxurious condition the right environments to protect the State's greatest asset. I then agreed to say something about maternity and infancy to you, and through you to the fathers and mothers, that they might be awakened to the great need of maternal and infant care in this state.

On this sacred soil and coast, about 150 miles from this place, on August 18, 1587, the first white American child was born. It was the beginning of maternity and infancy in North Carolina. It was the beginning, simple as it was, of our greatest public health problem of today.

The history of the early settlers of North Carolina is one of great dangers, sacrifices and hardships. They were strangers in a strange land and among a tribe of cruel Indians who were ever their foe. They had wisdom, they had rights, they recognized them and they defended them. They were brave and God-fearing. They had their problems, they solved them as best they could. They built homes and

tilled the soil, they fished, trapped and hunted wild game and traded with the Indians. They provided for home and family, they cared for the sick, they bound up their wounds, they buried their dead. As they increased in population and in industry their problems became more complex and they began to specialize. There were expert hewers of logs, fishermen, trappers, hunters of wild game, the farmer, the carpenter, the weaver of cloth, the preacher and teacher, the midwife, the medicine man. They had a right to live, to marry, to increase in population, to be law abiding, to have laws and to have justice. They had their theory about diseases, where they came from and how they were transmitted. They were hardy and brave and could defend themselves against their foes. They were passing from a simple beginning to one which was rapidly growing more complex from one generation to another. One lean century merged into another. One devastating war followed another. Massacres had to be subdued, freedom had to be secured, slavery had to be abolished.

A repetition of further history of North Carolina following the ravages of wars, when left despoiled and in gloom, will serve no useful purpose here: suffice it to say that she has come up through great tribulations, but she has come. She stands in the forefront of states because she has done things worth while. She has spent, and is spending, money to save her people from sickness and disease, to correct the physical, mental and moral defectives, to make living conditions safer and happier, to educate the public in personal hygiene and public sanitation, and in right living. She is spending thousands of dollars on public welfare, on agriculture and home economics, and millions upon millions for education and public highways and many other large expenditures, all for the betterment and protection of her citizens. But, notwithstanding the rapid progress she has made in agriculture, in manufacturing, in education, in public highways, in public health and public welfare, in caring for her unfortunates, her physical, mental and moral defectives, there is much yet to be done and the field is ripe unto the harvest.

The statistics for the years 1914 to 1924, inclusive, for maternity and infancy are available. The state is proud of its birth rate, 31.9 per one thousand population; it is proud that its death rate is no higher than it is, 12.2 per one thousand population, which is one lower than the average for the registration area of the United States. The state has a maternal death rate of 7.3 and an infant death rate of 83. per one thousand live births. That you may better understand the State's maternity and infancy problem, I wish to compare the state's rate with the rate in the Registration Area of the United States and the rates in four foreign countries, New Zealand, Italy, Germany and Spain. All rates are based on one thousand live births. The state's rate in 1914 was 90.3; in 1924 it was 83., a reduction of 7.3 in eleven years. In the Registration Area of the United States the rate in 1915 was 99; in 1922 it was 74, a reduction of 24 in eight years. The reduction in the Registration Area of the United States, covering a period of eight years, is a little over three times as great as the eleven year period in this State.

Now, with your permission we will leave North Carolina and the United States for a moment and see what has happened in some of the foreign countries in the last few years. In New Zealand we find the lowest infant death rate anywhere in the world. Its rate per one thousand live births in 1910 was 66, and in 1923, 44, a reduction of 22 in fourteen years. Italy had a rate of 143 in 1910 and 126 in 1923, a reduction of 17 in fourteen years. Germany had a rate of 193 in 1910 and 132 in 1923, a reduction of 61 in fourteen years. Spain had a rate of 150 in 1910 and 141 in 1922, a reduction of 9 in thirteen years. The graph presents to you at a glance the rates in this state and the United States since 1914 and the foreign countries from 1910 to 1923. Unfortunately, I cannot point out to you the many varied conditions in these countries which play vital and important parts in their infant death rates. But they have causes and they are known just as we have causes in this state and in the United States. Roughly classified they are accidental, communicable diseases, infectious diarrhea, fermentative diarrhea and ignorance. Of these, ignorance is the greatest cause and predisposing cause of them all.

Our maternal death rate is too high, and according to Dr. Ivan Procter of Raleigh, one of the best obstetricians in the State, ignorance is the greatest menace to childbearing women of today. Next to this he places neglect on the part of the patients and husbands to provide adequate professional service and facilities. This is largely due, he thinks, because there prevails a belief that reproduction is a natural function and therefore unattended by danger. He says that eclampsia kills more women than any other one condition incident to childbearing, and that it is his firm belief that this can be reduced 50 per cent by education and 40 per cent by hospitalization. The overwhelming need of more public health education is emphasized by our infant and maternal mortality.

We are living today in what may be called an age of children. Their parents are their natural protectors, they direct their lives and conduct, they instil ideals and customs, precepts and examples, ambitions and aspirations. They must lay the foundation right and guide them right or the State will step in and by right of law become their protectors and care for them during the crucial period of childhood and adolescence. Our state's statute books teem with legislation for their protection, improvement, advancement and welfare. Welfare departments and kindred agencies are engaged in the welfare of our new generation, charged with the responsibility of seeing that they are not neglected by their parents or by the State. You who have been making physical and mental examinations of marriage applicants since 1921, when the State enacted a law requiring all applicants to be examined by a licensed physician within seven days of date of marriage, have had a close-up observation and firsthand information why this legislation, why the welfare departments and kindred agencies, why delinquent, incorrigible, under-privileged, feeble-minded children are rapidly increasing and are daily pouring into the State institutions. We, who make these examinations free and who examine large numbers each year, many of whom are colored, but not all, ignorant and unlearned, have

probably a different mental picture from those more fortunate. Each physician has his own standard and by it he passes judgment, physically and mentally, and by a written statement says that they are physically and mentally sound, that they are free from tuberculosis in the infectious stages, that the male applicants are free from venereal diseases. What a varied and flexible standard! But we must call it good and one of the means of protecting the State's greatest asset. We can discern groping in the distant future that ever perplexing problem of birth control, which is being agitated in this country and which is believed by some, if practiced, to threaten our very civilization. But there is on every hand increasing evidence that sooner or later some measure should be taken to prevent mental defectives from propagating their kind, in and out of State institutions. At the present time we have not reached that period of intellectual attainment, and never shall, when it is possible for subnormal or defective men and women to become intelligent fathers and mothers over-night—to assume the great and noble responsibility of parenthood wholly unprepared for such a task.

The care of infants by parents for generations and centuries has been, in a large measure, a matter of self-training, and their children have been the subjects of experimentation. We see it every day, and wonder why there should exist today in the minds of parents, with such a responsibility and with free information for the asking, and in thousands of instances thrust upon them, a lack of knowledge as to the best means of giving their offspring a fair chance to live, to grow, to develop, to enjoy their divine rights at a time when innocence and love are at their highest. We should not lose sight of the fact that the supreme vocation of woman is womanhood: her rights in professional employment, in politics, in science and industry, are negligible compared with it. It is supreme and as such she should be trained.

I think we are all agreed that if we expect to lower the infant and maternal deaths, mothers and potential mothers must be educated in the fundamental principles of motherhood; they must know the importance of frequent prenatal examinations, proper obstetrical safeguards at time of labor, and careful puerperal supervision. They must have modern scientific knowledge and they must know its value; they must apply this knowledge in a simple and practical way to prevent unnecessary maternal deaths and to save infant life in its beginning. Mothers and potential mothers must be educated in personal health and be better prepared to take care of a double life responsibility, which is the most critical period of their lives. It is so important to their physical welfare. It is a frequent thing to find young expectant mothers seeking guidance from mothers, grandmothers and great grandmothers, and following it with all the confidence of soul, mind and body. These mothers are open books for the innocent to get information, wise or unwise, to rely upon during the most crucial period of their life and for their greatest responsibility. I feel like calling on mothers to look back, grandmothers to look further back, and great grandmothers to look away back, and visualize, as far as possible, just what wonderful opportunities and privileges we have today which were unknown to them a few years ago; the marvelous changes which have taken place in the last few years in

prenatal and infant care, in preventing sickness, in lengthening the span of life, in living conditions, by applying the ever continuous flow of scientific knowledge and proved facts, which today so readily and easily find their way to the public to make prenatal complications fewer, childbearing safer, infant care sensible, life more certain and therefore happier.

Our state is primarily a rural one. Its political organization is such as to make each county a separate unit of government, and as such the most logical unit through which the State can best organize, supervise and operate maternity and infancy work. I doubt that any one plan which I might suggest could be operated successfully in all the one hundred counties in the state. Therefore, whatever plan may be undertaken must be practical, it must be applicable and it must be flexible. It must fit into and dovetail with the peculiar conditions common to the county. I am, however, of the firm opinion that a considerable part of any plan can be successfully operated in any county in the state, if it has behind it a few conscientious men and women who have glimpsed their greatest asset. Any plan, to be a success, must have definite purposes and objects in view, and a personnel suitable and qualified to accomplish them. The plan and program must not be too complicated and elaborate, but as simple and practical as they can be made, to be of full value and of service to the county.

Perhaps I should not do so, but I feel that this paper would be incomplete if I did not suggest a plan, which in part or in whole can be successfully operated with gratifying results in any one or in all of the one hundred counties in this state.

1. Coöperation and financial assistance of the State Board of Health, with county health departments with whole-time and part-time health officers. The county is the most logical unit and its health department the proper agency through which to work. The health officer held responsible to the State Board of Health for results.

2. Maternal and infant statistics should be collected, tabulated and made known to the public. Number of births attended by physicians and midwives. Such information is vitally necessary and often forms the basis for preventive action.

3. The health department, whether state or county, should recognize the value and importance of coöperation with the county medical society, religious, social, civic and political organizations, boards of education, welfare department and other agencies engaged in welfare work.

4. Proper legislation to control the practice of midwifery and its enforcement.

5. Mother and baby clinics from May first to October first of each year. The clinics should be largely educational in character and conducted by a physician well trained in maternity and infancy work. The clinic should be governed by simple rules and held each month in communities where most needed. All mothers would be admitted to the clinic for instruction, but their well babies would not. Homes should be visited by the nurse to see that the physician's instructions are carried out, to give instruction which might be necessary to improve living conditions, water and milk supplies, sewage disposal, screening, vaccination, etc.

6. Prenatal supervision and care present many different problems. Lack of proper medical attention plays its part, largely because patients wait for the physician instead of seeking him. Lack of prenatal examinations and proper obstetrical safeguards. Lack of necessary preparation in the homes. Lack of hospital facilities. The midwives. The public must be educated to seek proper medical care, for it cannot and will not be carried to the great majority; hospitals must be made available; the practice of midwifery must be improved by teaching and elimination. Home visits by nurses, prenatal conferences, and suitable literature.

7. For each birth registered a certificate should be issued by the health department to the parents with name, date of birth, and a few words of warning. They will have more weight and will be of more value at this period of life than ever after.

8. Lecture course to high school boys and girls, segregated, illustrated by motion pictures, in physical development, in personal hygiene, in sanitation, in sex hygiene, in venereal and communicable diseases, and the importance of periodic examinations.

9. Success or failure will depend, largely, on the person or persons engaged in the work and to some extent on the amount of money available for it.

And finally, the flower of womanhood and manhood should be reached, which blossoms forth in every person's life, that period which is so attractive to the opposite sex, that indescribable something which attracts and draws people together in matrimony for the holy purpose of propagating and perpetuating their species, call it what you may, but whatever it is, it has but little relation to the fundamental principles of how to care for their offspring. Their life and safety and power to grow and to mature, their very existence depend on more than courtship and matrimony, depend on more than love and home, depend on more than wealth and social standing, depend on more than ambitions, aspirations and position in life. Important as they are, they are but smoking torches which must be brightened into flame by knowledge, which must have its beginning before the days of courtship and matrimony, before the days of home and offspring, before there is life to protect and its existence to be made safe. And with it all, and through it all, there must be implanted that something which causes a man to stand when he is hit, and what people remember about him when he is gone.

DISCUSSION

Dr. C. W. Armstrong, City and County Health Officer, Salisbury: I want to thank Dr. Bulla for this splendid paper. I feel well repaid for the trip by having heard this paper. It shows a great deal of care in its preparation, and it is on a subject in which we all should be interested, and in which I think most of us are interested. Maternal and infant care is worthy of serious consideration. If we hope to make a favorable showing, it is up to us to begin work on that line. I feel that one of the nurses doing this work could better discuss this paper than I, and I hope some of them will discuss it. I feel this way about it. I have been doing it for eight years. I have thought of a number of

different plans which I might put into execution, but have felt I was not getting anywhere. Just recently I decided I was wrong, because I do not believe there is a plan to do maternity and infancy work except through the nurses. I believe it is a matter of personal visitation. I do not believe it can be done through clinics, and I do not know that I blame an expectant mother if she does not feel like coming out to a clinic.

I do not agree with Dr. Bulla that the well baby should not come to a clinic. I think the well babies are the only ones we should admit. I do not think we should get into the treatment game at all, but look after the well children up to six years of age. That is the idea we have been trying to work on, and I believe it is working to our advantage in this state. At a meeting in Salisbury we had Dr. Anderson, from the Department of Labor, and Dr. Boyd from the State department. They can give you a great deal of help, and can be of a great deal of service. We had a four-day clinic of about 350 children, and found forty children that were normal. Of course, a great many had moderate defects. A great many needed only circumcision, but that, while a moderate defect now, may in later years be a serious defect.

I do not know that I can add anything further to what Dr. Bulla has said, because his paper shows a great deal of care and study, and I think it repays us for coming here.

Dr. A. S. Root, Raleigh: I quite agree with Dr. Armstrong about the well babies coming to clinics. The pediatrician has the greatest opportunity in public health of anyone I know. The greater number of his patients are not sick babies, but well babies, who come to him to be kept well. Many of us in children's work in this state have conducted clinics from time to time, and I feel that a great deal of good is being done by them, just as much for the well baby as for the sick. Then the older child should not be neglected. When we think that one-third of our American children are in a state of malnutrition, and that a third of our men who applied for public service in the great war were rejected because of malnutrition or conditions resulting directly from malnutrition, it is perfectly obvious that if we are to solve this problem we should attack it in early life, while the child is in a formative period. I think if the State Board of Health could organize this work for well babies and children, a great deal of good can be accomplished. I should like to ask Dr. Bulla if any such plan has been carried out in any other state in the Union, that he knows of.

Dr. J. Roy Hege, Health Officer Forsyth County, Winston-Salem: The question was asked me last year, how many prenatal cases attended the clinics in Forsyth County. The program had been quite short up to that time. We have had another year now. We have eleven clinic points, and hold prenatal clinics at each of the points once a month. The average attendance has been five at each clinic point a month, which would give us fifty-five during the month. That is the prenatal cases, not the number of mothers in attendance, because many times we have mothers in attendance with their children at the baby clinic. The prenatal clinic lasts forty-five minutes. A thirty-minute lecture is given by the physician holding the clinic. These lectures start with the anatomy of

the female, extending on through the period of gestation, etc., calling attention, of course, to the possibilities that might arise from pathological conditions. The women are particularly interested in it, and that interest is well demonstrated by the fifteen minute period following the lecture, which is just a round table discussion. Questions are asked by the mothers—any questions they wish to ask the clinician. We are very well pleased with this work. I do not know how it would work in other counties, but it works quite well in Forsyth. The question of transportation comes up, because this is strictly rural work. We have a bus in the summer that the janitor of the health department drives, bringing the mothers and children to these clinics. During the school term the regular school bus does this, making a special trip in the afternoon. I think it is quite possible to have prenatal clinics. It takes up a great deal of the nurses' time during which they might be doing home visiting, but the doctor puts across a lot of very valuable information to the mothers.

Dr. C. L. Outland, Health Officer Pitt County, Greenville: I do not feel that I can discuss this paper at all, but I want to throw out this suggestion. Without criticising the health officers individually, but criticising them collectively, and the State Board of Health, I feel that we should begin to extend our work in infant and maternal welfare. It is one of the biggest things confronting us. I know that I am in a rut; I have gotten to the point where I do not know how to go much further. We have had the clinics, and have had some home visitations. I believe if there could be some recommendation from the health department, or from the authorities, it would give us a little stimulus that would help us in this work.

Dr. R. L. Carlton, City Health Officer, Winston-Salem: I want to indorse everything Dr. Bulla said, except that the clinic should not be for well babies but for sick ones. I want to tell him to send sick babies to the pediatrician or general practitioner, and keep the well babies at the clinics.

Dr. Hege has been very modest about the prenatal work in Forsyth County, and about the baby clinics. I am particularly interested in the question of transportation. He makes the school busses work full time, and in the summer has the janitor run the bus. It is a very fine piece of work.

Dr. C. W. Armstrong, Health Officer Rowan County, Salisbury: I want to apologize to Dr. Hege for saying that this can not be done, for he is doing it, but Hege, fortunately, is able to get out in the highways and hedges and compel them to come in and we are not.

Dr. Bulla (closing the discussion): The clinic I have in mind is for mothers and babies. I think the clinic should be divided into two parts, (1) the educational, which should be for mothers and (2) for the examination of babies and advice to mothers as to their proper care and treatment. The educational part of the clinic is for mothers and their well babies, and the second part of the clinic would be for mothers and their babies who are in need of medical attention. Mothers with well babies can well afford to leave them at home, because they would not be benefited by the educational part of the clinic and time would be too important to give them an examination, as many of these

clinics probably would be held a good distance from the health department. Babies who are not being treated by physicians and whom the mother considers not sick enough to be treated, but of course who are, should be admitted to the clinic, examined, diagnosis made and the mother advised as to treatment.

As to Doctor Root's question, I do not know of any such program in operation in any state, but my idea of mother and baby clinics is that outlined in my paper and I believe it can be successfully operated and I trust it will be undertaken.

NUTRITION CLASSES IN OUR SCHOOLS

Theresa Dansdill, M.A., Director of Health Education, State Tuberculosis Association, Southern Pines

The idea once existed, possibly still exists in some minds, that a nutrition class means nothing more nor less than making children *fat*. Bringing to, or near approach to, normal weight is one of the objectives toward which to work, but it is only one. We cannot emphasize too strongly that weighing and measuring provide an index—that other procedures must be taken into consideration.

Children who are under-weight may be clasified into the following:

1. Naturally smaller than the average but normal.

2. Handicapped by some obvious remedial defect in the mode of living; (*a*) persistently poor dietary program—hungry cases due either to lack of food or to improper food—starving in the midst of plenty, (*b*) Inadequate sleep and rest. (*c*) Unwholesome mental attitudes—worry, fear, undue anger, pouting. These conditions are sometimes due to lack of home control—also to nagging, unhappiness, worry over financial status, or to over-excitement.

3. Handicapped by remediable defect—tonsils, adenoids, defective vision, diseased teeth, bad posture.

4. Obscure physical defects or wasting diseases—malaria, tuberculosis, hookworm, kidney trouble, heart weakness.

5. Convalescents.

6. Congenitally weak. "Just delicate", having a smaller vital spark than his companions—needing scrupulous care for many years until he can take care of himself.

7. Hungry cases. Malnourished children are divided into two groups—habitually stuffed and habitually starved .

Why are some children undernourished? Some individuals assert that it is because of infected tonsils, adenoids and other conditions which can more or less successfully be remedied by the surgeon or physician. Other investigators hold the reverse view, that the physical abnormalities are the sequels of faulty nutrition caused by restricting the diet for some time to a list of foods which are, singly or collectively, inadequate for the maintenance of normal nutrition. They contend that the difficulty lies in the fact that the children's food is not of the proper chemical composition, that the failure of health, and growth and the development of infections in the tonsils, the growth of adenoids and the formation of

bad postural habits are explained on this basis. The development of the bodily tissue is poor; consequently the resistance to infections is low; faulty posture is attributed largely to lack of strength in the muscles. The remedy does not lie wholly in the insistence on a correct posture regardless of the physical powers of the child but upon building vitality through the provision of a satisfactory diet.

Remember—the digestion is one of the first bodily functions to suffer in exhaustion and fatigues; individuals are unable to digest even if they had more and better food.

We strike at one of the great sources of physical unfitness when we begin the teaching of food values, of good health habits to *all* children regardless of whether they are undernourished or not.

WHY SCHOOL CHILDREN SHOULD BE WEIGHED

(Resumé from Holt—"Are Scales an Index?"). Did you ever see a six-year-old go into a railroad station with his mother and spying the familiar platform scales ask for a penny to be weighed? Better yet, did you ever see a six-year-old who did not want to do this? Incidentally, did you ever happen to see a little older person, say perhaps 15 or 20 or 40 years old, who rather liked to get on the scales and get an inkling of his poundage?

There is no getting around the fact that people do love to see that pointer swing around or that balance arm come to rest. It lets people in on a secret. It tells the fat lady something that she does not want other people to know. It tells the sedentary middle-aged golfer whether he is getting in better condition. It tells the mother and her physician whether the baby is gaining or falling behind. It tells the youngster how fast he is advancing toward that wonderful goal of "grown-up-hood".

And so a vast army of interested people who want to see the children of this country and all countries go through life with the least health-handicaps possible have made use of the scales as a means of getting children acquainted with themselves and interested in their health and growth. Interest in growth arouses a natural curiosity in the things that make for growth. Growth in height and weight is dependent largely on food, not only quantity of food but kind. The little children of Central Europe stopped growing tall and stopped growing heavier when war left them with little food. To help them in their distress other countries sent them food, not just food such as white flour and potatoes, but food that gave the most energy and promoted growth, such as whole wheat flour, peas and beans, bacon, cocoa and milk. Young children need milk, because, more than any other food, milk contains the salts of calcium and phosphorus without which bones will not grow.

The scales tell whether a child is growing heavier. Every normal child is taller and heavier this year than last year. If a child is not taller or heavier in a year's time, there is something wrong about the child or his method of living. It would be immensely easier for those looking out for the health of children if every normal child grew at a regular rate. Any child that did not conform to this gain would then be recognized at once. But the fact is that even children who do not

gain regularly in height or weight from month to month are apparently normal. Some children gain with fair regularity; others remain stationary or lose slightly and then gain with unusual rapidity. Still others fluctuate from month to month, now gaining, now remaining stationary, but eventually rounding out the year ahead of the previous year. There is no reason for alarm in the slight fluctuations in weight from month to month. The only thing that is absolutely significant is that children should not lose weight nor should they remain stationary in weight and height for a prolonged period. There is also a seasonable difference in gain. This seasonable difference is not unvarying but it is clear-cut.

It is for these reasons that we must not be too specific in stating exactly how much a boy or girl should gain from month to month. The expectancy of a gain is well founded. The reason for using the scales is to interest the child. It is a perfectly just and sound motive.

When shall a nutrition program function in a wholesome manner in every school in North Carolina? It shall attain its greatest usefulness when each teacher is trained to present health facts to her pupils correctly from the scientific as well as from the pedagogical standpoint. This program needs the professional advice, direction and encouragement of every physician and dentist in the community plus the coöperation of the parents and every one in the community who is interested or who can become interested in health education.

This greatly desired good is far distant at present; it is one that *can* be gained.

Each teacher in the state should be urged to have a definite place on her daily program for training her pupils in health procedure. Good health habits are formed more readily and are fixed more securely when they are stressed day by day instead of intermittently.

The program of health education is being builded on a firm foundation in North Carolina. The progress is slow, but there have been no backward steps. Sometime within the near future it will be so securely entrenched in our schools that the pioneers will make plans to blaze trails along other as yet almost unexplored by-roads to healthful living.

DISCUSSION

Dr. L. B. McBrayer, Managing Director N. C. Tuberculosis Association, Southern Pines: Dr. Rankin was scheduled to speak to us tonight, but will not do so because of his automobile accident. I imagine that he was going to tell us that we have done a great many things in a general way, and we have accomplished wonderful results in public health work in this state and throughout the nation and in other countries; but if we expect to continue to accomplish results, and if we expect to do what the people have a right to expect us to do, we had better get down to the individual, or we might term it, "personal hygiene", and if we go to work on the individual we must begin quite early in the life of the individual.

I do not believe that the people of our state, or that any class of people (having reference to the ordinary divisions, the different professions, occupations, and so forth) realize the importance of growing

good, strong, healthy—not goats, nor sheep, nor apples, nor beans, nor onions—but folks. I shall go so far as to say that I don't believe the medical profession as a class realize the importance of that.

It isn't necessary for me to tell you that it is the men and women of North Carolina that give value to our real estate. I suppose that is the greatest incentive right now that we could talk about. Just suppose, for an example, that no human being could come to Wrightsville Beach for a year. What would happen to this place? It wouldn't be worth a thing in the world.

Suppose all the people moved out of Wilmington, or even out of the great city of Charlotte—why, there wouldn't be a thing there that would be worth a cent, and real estate that is now worth a thousand dollars a foot couldn't be sold for ten cents an acre. All the other industries that are so necessary in bringing in the "long green" around the city of Charlotte would be of no avail.

Folks are more important than anything else, and if we are to grow fine citizens we must do the things that we have been talking about here, and more of them.

I expect Dr. Rankin would agree with me if I were to say that the matter of proper nutrition of the child from before it is born (and particularly after it is born) until it reaches at least adolescence is the most important single thing in the life of a human being. Without that, we cannot grow healthy human beings either physically or mentally.

So I leave this thought with you: We must turn our attention to the individual. It is more expensive to take care of these mothers and these infants than it is to vaccinate several thousand people against typhoid. I am not saying anything against that either, but we must get it clearly in our minds that while we have done these other things in a large way and done them pretty well, we must get down to rock-bottom and grow the kind of strong, healthy human beings that we can grow in North Carolina, and that we ought to grow, and that we are under obligation to grow. To do that, we must see to it that every human being is properly nourished—and that means a lot more than I have time to say to you, so I am just going to leave that thought with you.

Miss Dansdill (closing the discussion): I should like to close with a toast to health education—a toast that will come true—because before I leave North Carolina every county in the state will be carrying on this program.

"Here's to the cause and the days that are past,
Here's to the cause, it shall triumph at last.
The end shall illumine the hearts that have braved
The years and the fears that the cause might be saved.
That which we hoped for and sometimes groped for
Came not in the manner that it should,
We are here to confess it, but the cause—may God bless it!—
Will find us all worthy who did what we could."

MILK SANITATION

MALCOLM LEWIS, Assistant Engineer, Bureau of Sanitary Engineering, State Board of Health

The purposes of any program of milk sanitation are roughly three—First, to make the milk supply as safe as possible from the point of view of preventing epidemics of milk-borne diseases; second, to insure a clean product, free from dirt and of low bacteria count; third, to maintain the food quality of the milk by providing minimum standards of butter fat and other solids, and preventing skimming and watering. These three divisions are all so closely inter-related that it is difficult to discuss one without getting into the range of the others. Moreover, although not strictly an item of sanitation, any program to promote these objects should also be such as to call for the least expense to the dairymen, to increase rather than decrease production, and to increase consumption by establishing public confidence in the product.

Under the head of safety, the outstanding requirement is that the milk be kept free from pathogenic organisms. Those which find in milk an acceptable medium for growth, and when present may be the source of an epidemic, are commonly held to be tuberculosis, typhoid fever, amebic and bacillary dysentery, scarlet fever, diphtheria, and septic sore throat. Tuberculosis infection of milk may come from a diseased cow or from a tuberculous milk handler. Its elimination from raw milk calls for repeated tests of the herd, with removal of all reactors, and periodical physical examination of milk handlers to eliminate open cases of tuberculosis. Typhoid and dysentery infections of milk are generally caused by milkers whose hands are soiled with infected feces or urine. The milker may be a carrier himself, either fecal or urinary or both, or he may be in the early stages of the disease. Specimens of stool and urine from all milk handlers for the detection of possible carriers and prompt report of the occurrence of diarrheas to the health officer are the only practicable means of protection we know of. To further complicate matters some carriers may be intermittent, and certain specimens may be free from infection. A negative report is, therefore, not conclusive, and the examinations should be repeated, particularly in cases with a past history of typhoid fever. Scarlet fever, diphtheria, and septic sore throat infections of milk are probably caused by milkers whose hands are soiled with infected nose or throat discharges. Protection against these infections is most unsatisfactory, and consists in the prompt reporting to the health officer of cases of sore throat or rash. Mild, atypical and missed cases further reduce the efficiency of protection.

The residence of milk handlers in a house where a case of one of these communicable diseases exists, and the return of milk bottles from such premises to a dairy, are subjects for regulation. Considering the possibilities for infection at the dairy and the inefficiency of practicable preventive methods, we feel that although the safety of a raw milk increases as the precautions surrounding it increase, no milk in its raw state is entirely safe at all times. The final safeguard is pasteurization, *properly carried out.*

One question which I particularly wish to bring before you health officers has caused no little worry. The state laws and quarantine regulations provide for the control of *cases* of diphtheria and typhoid fever, but have little to say as to carriers. A few typhoid carriers have been found on dairy premises. In such cases what measures can legally be taken for the protection of the public health? I ask particularly with reference to counties without a health department, and where the city concerned is not the county seat. Would a state regulation prohibiting typhoid carriers from working in dairies, milk plants, or otherwise as food handlers be desirable?

The cleanliness of a milk supply might be considered to be an entirely esthetic consideration, but that is only a part of it. The cleanliness of the milk is an index of the care taken in its production and handling, and is reflected by its bacterial content. Dirty milk and milk of high bacterial content generally go hand in hand with digestive disturbances of children. While the bacteria present may be harmless in themselves, they may produce changes in the composition of the milk that render it unsafe for infant feeding. The lower the initial bacterial content can be kept by clean methods of production, and the lower it can be maintained subsequently, the more nearly the milk will remain in its natural state.

Ayers, Cook and Clemmer, of the Dairy Division, U. S. Department of Agriculture, have demonstrated by a long series of tests that it is possible for the average dairyman on the average farm, without expensive barns and equipment, to produce milk which has when fresh a low bacteria count. This can be obtained, even under filthy barn conditions, if careful attention is given to three factors, namely, sterilized utensils, small-top pails, and clean udders and teats. Common decency alone should not permit the production of milk under such conditions, for which no legitimate excuse can be conceived. It seems evident, however, that undue emphasis has been given to factors and methods of minor importance, while those which directly affect the bacterial content have not been sufficiently emphasized.

In the matter of equipment there should be a milking barn with concrete floor, containing 500 cubic feet of air space per cow, and provided with not less than 3 square feet of light per cow. The walls should be whitewashed or painted with cold water paint. Such a barn can be cleaned easily and the floor washed after each milking. Floors kept in clean condition offer no attraction to flies, and the barn will be practically free from them. Screening a barn is undesirable, as it cannot be completely done and makes the barn in effect a fly-trap. Manure should be removed and handled in such a way that it will not become a breeding place for flies. Spreading on the land seems to be the method of choice. During the winter months when the ground is soft it may accumulate for a while, but there is then no possibility of fly breeding.

There should be a concrete-floored milk house, near the barn, well lighted and screened, and painted on the inside. By locating it near the barn, each pail of milk can be strained in the milk house without causing undue loss of time to the dairyman, and where it will be free from

flies and barn odors. All the operations of straining, cooling, bottling and capping are to be carried out in the milk house, as well as the washing and sterilizing of utensils and bottles.

An adequate water supply from a safe source piped to the barn and milk house is an essential in a dairy of any size, to facilitate cleaning.

To prevent possible fecal contamination by flies, nothing less than the State standard pit privy should be tolerated on the premises.

The methods used are of even greater importance than the equipment. Sterilized utensils have been found to be the most important factor in producing milk with a low bacteria count. The most efficient method is to use steam. A closet can be constructed in the milk house with insulated walls, large enough to contain all the utensils, cans and bottles, and into which steam from a boiler can be introduced. Experience and experiment have shown sheet asbestos board, wood, and hollow tile to be the most efficient heat retainers, as well as the lowest in cost. Brick and concrete are the poorest. Wooden closets are built with double walls separated by a dead air space, which is an excellent heat insulator. The boiler used should preferably be at least 5 horsepower, and the steam can be used for other purposes such as driving a brush for bottle cleaning and heating water for cleaning. The requirement for satisfactory sterilization should be a temperature of not less than 160 degrees F. maintained for 30 minutes, which can be checked by a thermometer inserted through the side of the closet. Tests of many such boxes over the state have shown that this requirement is frequently exceeded. The use of hot water for sterilization is only effective when utensils can be boiled in water, and is much less likely to be done properly. It requires more fuel, takes a longer time, and is awkward to manage.

The use of small mouth pails will exclude much of the dirt and hair that would otherwise fall into the pail during milking, and has a marked effect on producing low bacteria count milk.

Finally, the cows should be cleaned before milking, and milked with clean dry hands. Gross dirt can be removed from the flanks with a curry comb, and this should be followed by a washing, including the udders and teats. A brush is better for this purpose, and much more handy. The brush will remove loose hairs, dandruff and other particles which would be matted down by a wet cloth and left to drop off when dry during milking. It is desirable to use a small amount of chlorin disinfectant in the water used for the washing, either B-K, Seri-Clo, or the solution that can be made up from commercial chlorid of lime. This has distinct germicidal effect on the udder and teats as well as on the milker's hands. Furthermore, if one cow should have an undetected mastitis, it would prevent carrying this infection to other cows through the medium of the wash water. Bottles are capped by hand; and in this operation the fingers necessarily come in contact with the under side of the cap, which will be next to the milk in the bottle. It is desirable that the hands of the capper be dipped in this disinfectant solution to avoid a possible contamination of the cap. Having the milk in the bottle, and

presumably with a low bacterial content, it is necessary to keep it at a temperature of 50 degrees F. or lower in order to prevent the further growth of bacteria.

Marshall's Microbiology gives a table showing effect of temperature on bacterial growth in milk. Seven samples of the same milk with an initial bacteria count of 5,000 per cc. were held for twelve hours, one sample at each of the following temperatures: 40, 45, 50, 55, 60, 70 and 80 degrees F. The samples were then plated and counted. The counts were as follows:

40 deg. sample	4,000
45 " "	9,000
50 " "	18,000
55 " "	38,000
60 " "	450,000
70 " "	8,800,000
80 " "	55,000,000

It is for this reason that all authorities are agreed that milk should be cooled to a temperature of 50 degrees F. or below and maintained at that temperature until delivery.

Under the head of quality I refer to the chemical composition of milk. The State and Federal standards require a minimum of 3.25% butter fat, and 8.5% solids other than fat. Some herds entirely of Holstein cattle may have difficulty in producing milk of even this standard; others, such as Jersey and Guernsey herds, will far exceed this. The requirements should define milk as the "whole" lacteal secretion, etc., to prevent the removal of cream or the addition of water. Aside from fraud, the chemical composition of milk is of interest to the health officer from the nutritional and dietetic standpoint.

Milk produced under the conditions outlined should be of low bacteria count and as safe as raw milk can be made to be. To provide for such production requires more than an ordinance. The services of a competent inspector are required, and one with the personality to win the confidence and coöperation of the dairymen. Laboratory facilities for the bacteriological and chemical examination of milk must be available, and someone competent to carry out the analysis. These necessities can be provided in different ways to meet the circumstances of each individual city, but they should be satisfactorily arranged before a milk ordinance is passed. Otherwise the project will be a failure.

In his paper last year at Pinehurst Mr. Miller discussed at some length the Standard Milk Ordinance, approved by the State Board of Health and recommended by them for local adoption. I do not intend to repeat at this time, except to say that the requirements suggested in this paper are embodied in the Standard Ordinance. However, by providing for grades of milk, the Standard Ordinance gives the dairyman a powerful incentive to produce the best, and increases public confidence in the product.

There are now 35 cities in the State which have adopted the Standard Milk Ordinance, and in which the State Board of Health is bringing about uniformity of inspection judgment and interpretation, to the end

that Grade A in one city will have the same significance as Grade A in any of the others. The last report from the Public Health Service stated that the ordinance had been approved as standard in nine other states—namely, Alabama, Texas, Missouri, Kentucky, Tennessee, Virginia, Arkansas, Louisiana, and South Carolina. The ordinance has been independently adopted by the cities of Rochester, Minnesota, and Athens and Atlanta, Georgia. The total is 10 states and 83 cities, of which 35 are in North Carolina.

During the week of May 28, 1926, at the meeting of the State Health Officers with the Surgeon General, the Committee on Standard Milk Ordinance reported it as satisfactory with a few minor modifications, and the ordinance was adopted as standard for the United States by the Conference.

DISCUSSION

Dr. L. Jack Smith, City and County Health Officer, Wilson: This milk ordinance, as far as I can see, is the most perfect ordinance that I have ever had the opportunity to read, and it is practical except in one or two things, one thing especially and that is it does not give due credit for end results. What I mean is this:

I have in mind two or three dairies in my town which we have graded C. As a matter of fact, bacteriological examination of the milk from those dairies shows that they are not far below some of our dairies that are graded A. I happen to know that the men who conduct those little dairies look after them personally and produce a safe, good milk. Yet under the ordinance I am compelled to grade them C because of their lack of equipment, what we call standard equipment.

I am not bringing this up from the standpoint of destructive criticism, but rather that we might arrive at some constructive method to correct this, which I think is an error.

I hope that this point can be settled, because it has placed me in rather an embarrassing position. For instance, a dairyman comes in and says, "Doctor, I would like to have a report on my milk."

All right! What can I do? I have to give it to him. He takes that out and shows it to his customers, and it shows that he has four and a half per cent butter fat and that he has a bacteria-count of below twenty thousand. Yet I have to grade him C. It is very embarrassing.

I don't know how to get around that feature of the ordinance. I bring that point up, as I say, not from the standpoint of destructive criticism, but rather as constructive criticism.

Dr. J. H. Hamilton, County Health Officer, Wilmington: I don't want to interfere with Mr. Lewis' closing discussion, but I should like to answer Dr. Smith's question because in endeavoring to enforce a milk regulation for the last four or five years I have had any number of complaints exactly like the one Dr. Smith mentioned.

We have to take this point of view more or less: that bacteria count is not the end result, that it is one means of evaluating milk; the aim and purpose of all of our procedures in handling milk is not to produce a small number of bacteria, but to control the kind of

bacteria that are in milk. It is easy to imagine milk of higher bacteria count being a safer milk than milk of low bacteria count, if the bacteria in the milk having the high count are of a safe type and the bacteria in the sample containing the low number of bacteria are of a pathogenic or near-pathogenic type.

I don't see how we can correct this thing that Dr. Smith has complained about, because the Constitution of our land recognizes men as free and equal. We cannot grade men, although we know in our hearts that some men are dirty and some men are clean. Yet we cannot put that down in our regulations, and in so far as we have that injustice I think we shall have to endure it, realizing that we are working under schemes that are man-made and that therefore are imperfect.

Mr. Lewis (closing the discussion): I don't think there is much to say in closing, except possibly to quote from Dr. Smith, unless he wants to tell the story of the well, himself. Dr. Smith, do you want to tell them the story of the well with no rails around it?

Dr. Smith: All right, I will tell it, and it will be right in keeping with the thought I have just mentioned.

A certain dairyman in our town came in, with fire in his eye, because I had graded him what he thought was too low. I emphasized the fact that he needed equipment in order to carry out this ordinance, and I illustrated it in this manner. I said, "Suppose you have two or three children and suppose there is an old well in the lot in which your children play. They might play there all their lives and never drop into that well, but there is a possibility or a probability that those children will drop into that well some time."

I am not talking about that fellow now when I mention this fact, but if a man has a consistent low count over a period of six or eight months, I can't help but believe that that man is clean. But the fellow who drops in the well every once in a while is the man that needs better equipment.

I don't know how to correct this thing, gentlemen. I am merely mentioning this to show how I feel about it. The situation is embarrassing, and unless we can fix it up so that those end results are given due credit and the dairymen are given a better showing, I don't see how we are going to be able to hold up our heads. I just don't see how we are going to do it.

I appreciate the truth of what Dr. Hamilton has said: that it is not always the low count milk that is the best milk, that the low count may have pathogenic organisms in it that produce disease. But here are two dairies conducted by people who have had these tests made. You look at them and you see that their circumstances are practically equal, as far as producing clean milk is concerned. One of them has a consistently high count and the other one a consistently low count. Just what is your conclusion? I call those end results. They are bound to be end results.

I am in favor, in some way or other, of giving credit for end results. A clean man can go into a dirty barn and get cleaner milk than a dirty man who goes into a clean barn. That is what I mean.

THE UTILITY OF SPLENIC EXAMINATIONS IN MALARIA SURVEYS AND METHODS FOR THE IDENTIFICATION OF ANOPHELINE LARVAE

Mark F. Boyd, M.D., International Health Board, Edenton

It occurs to me that the most appropriate subjects to present for the consideration of this body of health officers are the results of some studies initiated by the late Doctor S. T. Darling, while he was Director of the Station for Field Studies in Malaria.

I presume that many of you are confronted, among the other problems commanding your attention, by malaria, and may be discouraged by the apparent magnitude of this single problem. I do not intend to intimate that malaria is not a serious problem, but I feel that perhaps certain procedures I shall discuss may result in a clearer definition of the problem, and that when more clearly defined and better understood it may not appear so overwhelming, and as a consequence feasible lines of solution will be evident.

The newly installed health officer surveying the mortality returns for his county, and who observes that malaria occupies a conspicuous place, may feel appalled by these figures, under the apprehension that he is confronted by a problem of equal intensity in all parts of his jurisdiction. This may or may not be the case, and before reaching any conclusion regarding this question he should undertake to determine its extent and character. Mortality and morbidity returns have a lesser value in the epidemiological study of malaria than they do in the case of any other disease. The return "malaria" on a death certificate is frequently a confession of inability to arrive at an accurate diagnosis, or reflects a tendency to charge to the account of malaria more than that for which it is really responsible. Morbidity returns from physicians will not give the complete picture of the intensity of infection, due to the relatively small proportion of active cases that come to the attention of those in practice. Hence the collection of epidemiological information concerning malaria requires the exercise of especial initiative on the part of the health officer. Fortunately we possess two procedures whereby the existence of chronic malaria infection may be detected, and a population group—i. e., school children—of a susceptible character is conveniently concentrated for rapid examination at a certain season of the year.

The first of the procedures for the detection of chronic malaria, and which in the United States has been better known, is the microscopical examination of blood smears for the recognition of malaria parasites. Unfortunately the application of this procedure to a county-wide series of examinations has certain drawbacks that seriously limit its utility. Positive results have a very definite value, but unfortunately in cases of chronic infection a single examination may not permit the recognition of parasites in infected persons, consequently the percentage of errors of omission is certain to be high.

Secondly, the laboratory examination of blood specimens is a slow process, and if undertaken on a county-wide scale will either, in the case of immediate information being required, necessitate an extensive

corps of microscopists, or, as is usually the case where the county budget can not provide such special assistants, a considerable period of time will have elapsed before all the smears are examined and the information is more or less out of date when it becomes available. Thus the cumbersomeness of this procedure has diminished the extent to which malaria surveys should be utilized.

Malaria workers within the tropics have for years extensively utilized the determination of malaria splenomegaly as an important aid in the delimitation of a malaria problem, with or without the examination of blood smears simultaneously collected, and in these regions this procedure has given uniform satisfaction. Comparatively little attention has been paid to the determination of malaria splenomegaly in the United States, due apparently to the rather general feeling that in the United States the procedure was less trustworthy. This lack of confidence apparently has arisen from the fact that in this country the same degrees of splenic enlargement that are encountered in heavily endemic regions in the tropics are but rarely seen, and furthermore that relatively slight degrees of splenomegaly tend to rapidly subside.

Studies carried out by Doctor Darling indicate that in centers of endemic malaria in the United States, splenomegaly has the same significance that it has within the tropics, and that the proportion of individuals harboring parasites will vary directly as the degree of splenic enlargement, while as a rule the number of individuals showing splenomegaly may be expected to exceed the number in whom parasites can be demonstrated. Doctor Darling also concluded that in order to detect the lesser degrees of splenomegaly it is more satisfactory to examine the individual in a recumbent position, since under these circumstances slight degrees of enlargement are readily detectable. Some little practice under competent direction may be required before an examiner may be relied upon to detect slight degrees of splenomegaly. The fingers of the right hand should rest lightly against the bare skin of the abdomen just below the costal margin at about the level of the seventh and eighth ribs. With the knees of the patient flexed he should be instructed to breathe deeply. Under these circumstances the edge of slightly enlarged spleens may be felt to approach the costal border, as the lungs expand, which might be overlooked if forcible palpation were employed, or if the aid of deep respiration were not secured. The palpating hand should not be applied with force, as this produces muscular rigidity and may result in slight deflection of the spleen. Attention has recently been called to the occurrence of a slight degree of splenomegaly in measles. This, however, I do not feel is likely to disturb the value of this procedure in the study of malaria. In rural communities measles when present is usually epidemic. The splenomegaly apparently does not persist for any great length of time and the degrees of splenomegaly might be expected to be very uniform. In malaria splenomegaly, on the other hand, we may expect to find considerable variation in the sizes of the enlarged spleens encountered. Spleen examination should be preferably made in the late summer or early fall, when the greatest number of enlarged spleens may be expected. Percentages of splenomegaly below five probably may be safely taken to indicate the

absence of an important malaria problem. Employing this procedure a health officer can rapidly go over the children in all the schools in his county, localizing the extent of the problem by school districts and in addition marking on a spot map the places of residence of those exhibiting splenomegaly. Having done this it is probable that with very few exceptions he will find that his problem is not of equal intensity in all parts of his county; indeed in the greater portion of the county malaria may be negligible, and subsequent study of a localized problem may reveal a simple solution. In any event, no anti-malaria work of any character should be planned without previously determining the extent and character of the malaria problem, and for this purpose the method of spleen examinations can heartily be recommended.

The direction of malaria control measures is appreciably simplified as well as made more economical of execution, if attention is limited to the transmitting anopheline species, which, for the greater area of the United States at least, would appear to be *Anopheles quadrimaculatus*. The quick recognition of the three common species of anophelines found in the southern United States in the larval stage is thus a matter of considerable convenience, as it eliminates the necessity for the breeding out of individuals for identification, with a consequent delay and possible loss of material. The means of identification elaborated by Doctor P. F. Russell, while attached to this Station, are giving very satisfactory results. In this method attention is centered on the anterior inner clypeal hairs situated on the anterior margin of the head, and the small antepalmate hairs situated on the fourth and fifth segments of the abdomen. The larvae of *anopheles crucians* can be recognized immediately by the presence of bushy antepalmate hairs, while in *anopheles quadrimaculatus* and *punctipennis* the hairs in this situation are either simple or at most two branched.

Anopheles punctipennis and *quadrimaculatus* can in turn be distinguished by the distance separating the bases of the anterior clypeal hairs. In *punctipennis* these hairs have the bases very closely approximated, while in *quadrimaculatus* the last are separated by an appreciable distance. Only fourth stage larvae can be employed for this purpose. The larvae should be put in a thin film or small drop of water on a glass slide, illuminated from above, and should be examined with the low power of the microscope. It might be of some advantage to slightly narcotize the larvae by chilling the glass slide and water, or by placing them in a small drop of chloroform water on the glass slide, in order that they remain quiet while under examination.

DISCUSSION

Dr. D. E. Ford, County and City Health Officer, New Bern: I found this paper, as I am sure all of us have, a very well written paper from the literary point of view, very clear, and quite to the point.

Four years ago, and also the following year, we did intensive malaria work in Craven County, and carried it on not in the hope of eliminating it entirely, because our county has a large swamp area, and drainage is almost impossible—that is, impossible until our people see further ahead and real estate becomes more valuable, making drainage

and filling in an economic possibility. Our rural community has been poor, and we didn't have the money to do any practical drainage work. So we made a survey as the doctor has pointed out, making blood smears and examinations and intensively educating the people in the way of attacking malaria, and in a wholesale way reducing the number of patients who are in a stage where they can transmit the disease.

I feel that malaria is gradually getting less, even without this work, at least throughout our state, but I do know that our work in Craven and the work in surrounding counties, where it was carried on extensively, has greatly accelerated the reduction of this disease.

I agree with Dr. Boyd that statistics, morbidity and mortality statistics, do not show the amount of malaria nor the number of deaths from malaria.

One year we had ten deaths, eight of them in Negroes under one year of age, six of these eight with death certificates signed by the same colored physician. Four of them I traced down and found that they hadn't been even seen by a physician. None of them had ever received a special examination.

In regard to morbidity, the amount of malaria, you older practitioners at least throughout the state know how the people accept this diagnosis; they think they have it and are ready to accept the physician's diagnosis; you know how easy it is to say, "Oh, yes, you have malaria", and give them quinin, even though it may be some simple thing that could be overlooked, perhaps. People are still ready, more or less universally, to accept that kind of a diagnosis.

So I feel that our two years' intensive work, and it is still continuing in a routine way on a much smaller scale, has greatly accelerated the reduction of malaria and the severity of cases. We haven't had a case of hemorrhagic fever in two years. I think there have been two cases there in four years.

I should like to carry on some work on the study of the mosquito in and about New Bern under Dr. Boyd's supervision, but as I say it is not a problem now that our people can understand as being important enough for special appropriations, and we haven't the personnel to do that work.

I was very glad to have had the opportunity of hearing this paper, and I would like to have Dr. Boyd come down to New Bern to look over our city and give me some advice and suggestions with regard to carrying on the work there, with the personnel we have.

Dr. J. W. Williams, County Health Officer, Washington: In our county malaria is still a problem, yet I feel that we have cut it down in two ways; first, by getting the people on quinin, second, teaching our colored physicians they must not sign a certificate of death as caused by malaria just because it happens to be convenient to do so and no diagnosis has really been made.

I think if I had heard Dr. Boyd's paper three years ago it would have saved me a great deal of trouble. We wanted to know just to what extent malaria was present and, as we could not depend upon

histories, we made a house to house canvass, took blood smears and had our technician examine each one twenty minutes before it was marked "None found."

Three years after I did this work, Dr. Taylor spent some time with Dr. Darling of the I. H. B. Research Laboratory at Leesburg (whom Dr. Boyd is succeeding) and he learned that we could place a child on a table or stand him up, palpate the spleen and find out nearly as much about that child (as far as malaria was concerned) as if we had driven twenty miles, took a blood test, returned to the office, stained and examined for two hours.

We proved this method out with five or six hundred school children, for all of whom we had recent record of blood findings. The splenic index ran higher than blood. It is a splendid index, and I believe it is especially the method to arrive at the prevalence of the disease in a county and certain sections of the county before going into the details involved in blood work and control. He spoke of Dr. Russell's method of indentifying larvae. This is another method I would have profited by, had I known. I had to wade the water, dip those wiggle-tails, carry them to the office and take the risk of their dying before they could emerge and I could tell just what type of mosquito I was dealing with. Now by this method, all I have to do is lay them on a slide and with my microscope identify the type of mosquito they will become.

I think every health officer who is interested in malaria should make a special trip to Edenton this year and spend a few days; if really interested, take his vacation this way. It is a pretty place, nice people, pretty girls and plenty of water in which to swim and at the same time be associated with Dr. Boyd and his staff in a real study of the malaria problems in our state. I believe he will get many new ideas about the disease that will benefit him in his work.

There is another mistake we made in our malaria study in Beaufort County. Dr. Boyd picked it up for me the other day, in looking over the maps we had made. We did not make a detail spot map. We made a house-to-house canvass but we listed them as per post office. In recording our findings we would say in the vicinity or service of such and such a post office the rate of infection was so and so. I know now, in thinking over our work, we passed five, six or seven houses that gave no malaria history nor would parasites be found in the blood, then on down the road we might reach another little bunch of houses in one of which the blood of one or more of the inmates would contain gametocytes and the latter part of the summer the other neighbors would have malaria. I know now that we did not use our spot map correctly, because had we done so we would not have overlooked these foci.

As one interested in malaria, as one of the health officers I again ask you to visit the work at Edenton. Perhaps when Dr. Boyd gets the work going he will do some visiting to other counties and help us out with suggestions and later when it is possible to get the children in groups he will visit around and show us about the palpation of spleens, using our own local material.

His paper contains valuable and practical suggestions and I wish to thank him.

Dr. Boyd, (closing the discussion): I am sorry that it is not possible for me to make a lantern slide projection of the larvae characteristics, but any of those who may be interested in following the question of larvae identification can write to our New York office and get reprints of Dr. P. F. Russell's paper on "The Identification of Larvae" which will illustrate it and make the question very simple.

FOR THE GOOD OF THE ORDER

L. W. Corbett, M.D., City and County Health Officer, Goldsboro

In the next few moments I want to discuss with you what my idea of the county health department is, and how we may work more harmoniously with our county medical society.

I haven't had the good fortune to visit all of the county societies in my district, but the ones that I have visited are almost in perfect accord that there is something wrong with the relationship. In some societies there are cliques, factions, etc., who hate, loathe and despise all the other groups in the society, but are willing any time to agree with anybody or faction that they are "agin" the health department as it is run in their particular county, and yet if the commissioners get wind of this and decide to abolish said department, who are the boys who wade into the fight and demand an appropriation in keeping with the size and wealth of their county? This at once shows that the differences are not so real as they seem, and one sees that the whole trouble is due to a lack of appreciation or evaluation of the other fellow's vices and virtues.

Numbers of us are very much like that gorgeous creature of ancient mythology, the fillyloo bird, who flies backwards in order to keep the dust out of his eyes. In other words, in looking backward all the time we never see a thing until it is past, and too late to take proper action. There are numbers of differences that arise from time to time between us and the general practitioners, and the fault is not all with them. We are too prone to say, "Well, part of the duties of a health officer is to be cussed, maintain an equal temper, and let it go". Some health officers have told me that they do not belong to their local society and attend very few, if any, of its meetings. To my mind, the health department should assume somewhat the role of the war department of the county society, standing always at their side to support their diagnosis and see that every possible effort is made to advertise the legally authorized physicians and steer patients around the pitfalls of chiros, osteos, optometrists, naturopaths, etc. There should be in every county society a committee on public information, consisting of the health officer and two or more brother members of the society. It should be their duty to prepare and pass on all information that the department or the society cares to broadcast. Our committee has recently begun a column in the Sunday morning paper, which reads something like this: "The Wayne County Medical Society will coöperate with the Wayne County Board of Health in publication of such medical news as may be useful to this community.

"This step is taken in accordance with the policy of the State and national organizations. An effort will be made to have articles of timely interest and applicable to this particular community. It has been

proven that good health is an economic asset of inestimable value, and this fact needs no argument. Much has been accomplished in a general way by education concerning the principles of sanitation and hygiene. It is thought that the time has come to spread more specific information for the benefit of the individual in this particular community. The general health is made up of the sum total of the individual. Science has deducted, from accumulated data, much valuable information for the upbuilding of the citizenship, and it is most apparent to the casual observer that the oncoming generation will act on scientific, intelligent information.

"Time was when a man might, at his own election, have any kind of disease that his soul desired, entertain any kind of parasites, feed and support them on the common range, interbreed his microbes with those of his neighbors, without question, establish his pet strain of hookworm in any soil he chose, and measure his manhood by his ability to become the parent of some sort of offspring at least every eighteen months. His chief responsibility was the fortune of the Democratic party, and his ideal candidate was the man who could run the Government without taxation. Evolution, among other things, has produced the modern mother, who says she will have only as many babies as she can nourish and care for. Moreover, she will not have babies sired by syphilitic, alcoholic, degenerate "creatures called men". She wants no crippled, blind, imbecile life-long cares; because she has some other things to do, as after awhile the body politic needs her. So the unterrified freeman above referred to looks at her bobbed hair, uncorseted muscular figure, views her level eyes full of the wisdom of creation and the lure of immortality, and cries to the gods to show him how to act like a man. She has established the medical marriage certificate as the first step. The next move is his. Our advice this week: Ask your medical man to make a survey of your health resources at regular intervals and advise you how to liquidate your liabilities and conserve your assets."

Each week various phases will be run. Any questions mailed to the paper will be answered through the paper, and stamped self-addressed envelopes will be returned unanswered. In this way no one can feel that the committee is seeking its personal aggrandizement. If this is strictly adhered to, the committee has in its power a tool which can yield a terrific influence on the lay public. Suppose that some rainy afternoon, when there isn't much to do, you sit down and write yourself a letter something like this:

Dear Editor of Medical Forum: I am the mother of eleven head of children, and praise God I ain't never had a Doctor to me with any of them, and while three of them came here too soon and two of them got the cord around their neck and strangled, the other six was birthed as pretty babies as any one has ever seen, that is except poor little Theo, who died with the nine day fits, and the two that has the colitis. Some said it 'twas the colitis, but I know 'twarnt nothing but the cold on his stomach, and if I could have got out and fixed plenty of herb teas it would have got well. What I wants to ask about is: what right has that new fangled nurse, who holds some kinds of meetings, got to tll my Mary that she'd ought to go to see a doctor, 'cause she's swelling up some, and when she stands up and stirs around sees lots of spots in front of her eyes? I told her she needn't listen to no more of that kind of fool talk 'cause

the reason of her seeing them spots and sich was 'cause it was full of the moon when she got that way. Ain't I right? Please put a piece in your colyum and tell me what you think about it, 'cause I really wants Mary to do what is right.

Yours truly,

ANXIOUS MOTHER.

Just what would you say to Anxious Mother? Overdrawn or far-fetched, you say. Maybe it is, but the meat of the cocoanut would come in your reply, and if you make your questions wild enough they will be read and read with a relish; for to one class they are the Sunday comic, and are read for amusement, but the little sermon on the end will sink in. When Anxious Mother asks us to tell the difference between the chiros and the other doctors, she is *told.*

Gentlemen: There is no question that has brought about more argument and criticism of the health officer and his department than the charity work, which, under the law, he is supposed to do. If he attempts to answer out-patient calls here and there he and the practitioner are going to be imposed on, and his entire time will be taken up in the practice of State medicine, and he will arouse a literal hornet's nest in his county society. If, on the other hand, he doesn't treat various public charges, who are in definite need of his services, the same society openly accuses him of being a chair warmer and wearing out the nethermost part of his trousers. Our department has refused to pay any out-patient calls, except in consultation or when accompanied by the county welfare officer. We do, however, conduct a rather extensive office clinic, which is growing all the time, and has about grown to such a size as to require too much of our time with our limited personnel. Therefore, our department is trying to put over a rather radical move. All medical men realize that the doctor does a tremendous volume of charity work, but the general public has always thought that this was a part of his job, and little, if any credit, is ever given for the personal professional service so freely given. We have, therefore, evolved or worked out a plan, which if adopted will give credit where credit is due, will stop a great deal of dead-beating, will relieve the doctor of a lot of unnecessary calls, and as we see it, will be the *sine qua non.* Roughly, the plan is to have the county medical society donate the lump sum of $10,000 to the community chest, said sum to be prorated among its members, and paid in professional services rendered. This will place the society of twenty-five men on record as donating one-fourth of the total chest fund, and will let the public realize just what the society gives to the indigent poor of our community. Suppose we stop just here for a moment and consider how this will work. The secretary of the associated charities or C. O. S. will direct all of the charity visits or treatments which will be given. She knows at the beginning of the year that she has an item of $10,000 worth of professional services in her budget, therefore she will be rather careful whom she orders to the doctor. $10,000 wouldn't go very far among the dead beats, so she will be very careful to give free service only to the actually needy. She feels perfectly free to call on any doctor for just so much work per month. She knows in advance that she will be charged the regular fees, but that instead of issuing pay checks, she will issue credit vouchers, which the profession will receive up to and not above

the promised amount. Along about the middle or third quarter of the year she will call you some day and say, "Doctor, I want you to go out to see Jim Blank, 909 Salversan Ave.," and you will reply, "Well, Mrs. Secretary, I will be glad to go, but in looking over my books I find that I have about worked out all of my promised amount and I wish you would call somebody else." She will reply, "But, Doctor, that's just the trouble, nearly all the doctors have done the same thing and I don't know what to do." You can then say, "Mrs. Secretary, of course I'm not one of the trustees or guardians of your community chest, but I am a member of the medical society, and if your funds are so depleted that you are unable to carry on for the rest of the season, I will be glad to make a motion at our next society meeting that we raise our donation as much in proportion as your other contributors; in other words, if your bankers, lawyers, real estate men, etc., will raise their donations 25 per cent, our society will, I believe, raise the other 25 per cent, but we do not feel that we should raise our donation unless the others do theirs proportionately."

By adopting some such system, the practitioner will get a lot of attention from the public that he has long deserved, but never had awarded, for his untiring efforts in relieving human suffering and disease. It has another angle that would be a help to the practitioner: Bill Jones, who owes the doctor for the last baby's delivery, for treating Willie with the measles, and a number of other visits, comes walking into the office and says, "Doctor, my old lady is down again, and I've just got to have you go out there and see her." The doctor picks up his ledger, throws back the cover, and after finding the page, says, "Bill, did you know that you owe me $150.00 already?" "Yes, Doctor, but I've been in powerful hard luck, and I just couldn't get around to pay you." "Well, Son, that's true, and it doesn't look to me like you are going to be able to pay me any time soon, and I wouldn't have the heart to charge any more to you at present, and if I went it would probably be charity but I have quit doing all charity practice. I belong to the Blank County Medical Society, which has contributed $10,000 for the Community Chest. Now, if you need a doctor, and I believe you do, all that is necessary is for you to go down and see the charity organization secretary, state your case, and she will send you a doctor." Bill sorter hangs his head, and says, "But, Doctor, they might not send you and you know the kids and my wife like you, and we want you." The doctor then replies, "Bill, that's a fact, and I really doubt if they will send me because I've done quite a bunch of work for them this month." He then replies, "Well, Doctor, suppose I go out and raise enough to pay for this one call, will you let the bill stand as it is?" The doctor replies, "Why, yes." Bill goes out, gets the money, the doctor pays the call, and both have a higher regard for each other. If, however, Bill really can't get the money, the charity organization secretary will supply the necessary services.

This idea or scheme sounds, of course, to some you know somewhat fantastic or ultra-utopian. But we believe that if analyzed and the individual details carefully worked out, it will be found a practical solution of a great many of the differences between the practitioner, the public and all other parties concerned. Another thing, when they come

walking into the doctor's office, with a begging list to provide hair nets for the Fiji Islanders, or back combs for the Igorrotes, the doctor smilingly assures them that he would be delighted to represent such a worthy cause, but that he belongs to the Blank County Medical Society, and that as a member of the society he makes his contribution for all charity of whatever nature through and by the way of a community chest. He is certain that the so noble cause will have very little difficulty in getting a reasonable contribution from the trustees of the community chest. No, he doesn't know who they are, or just when they meet, but you can easily find out.

The health department should wage a continuous, unrelenting fight on the venereal problem, and strive always to ascertain the sources of infection, and perhaps invoke punishment on the carriers or purveyors of this disease. To illustrate: A few weeks ago a high school boy in the upper end of the county came in with a filthy, dirty case of gonorrhea, and a nasty hair cut. Upon being questioned closely, he gave the name of a school girl as the source of infection. The sanitary inspector was sent to her mother with instructions to come in with the daughter. About an hour later the telephone rang and Mrs. Blank wanted to know what the health officer meant by sending her any such message and was he certain that he had the right party. She was asked, "Mrs. Blank, do you live in a two-story blue house three doors from the corner of B & C streets?" When she replied, "Yes," she was told, "Well you better come straight in and get this matter cleared up." In a little while, mother, daughter and father came in, the father perplexed, the daughter anxious, and the mother mad.

I asked that the mother came into my office for a few moments alone, but she said, "No, sir, if you want to talk to me, talk to my husband". I said, "Well, suppose I talk to your husband first, then you?" So her husband settled it by telling her to go on in. When we were both seated I said to Mrs. Blank, "I don't believe in beating about the bush, and I have something unpleasant to tell you, which the sooner said will be the better. What I sent for you for is to tell you that your daughter has been reported to us as having venereal disease." She said, "Doctor, what is that?" I replied, "Bad disease." "My God, Doctor, you don't mean to insinuate—" I said, "No, Mrs. Blank, what I mean to say is that we are treating a young man with a bad disease, who claims to have caught it from her. Now, before you get mad and say anything or ask me who he is, just take your daughter into the other room and talk to her; tell her what I have told you and tell her the time to cover up is past, tell her that if it is true to tell you and you will take her to your family doctor to be treated, but that we are going to have facts here and right now; if she is innocent and virtuous, I'll tell you who the boy is; if she is guilty, ask her, she knows." She and her husband took the girl into another room, and thirty minutes later they came out, tears, remorse, and shame on their faces, but the father, stepping into my private office, said, "Doctor, I have had deaths in my family, I have had fires, and I have had my share of trouble, but this is the worst yet. Mary Jane admits that she

has been having intercourse with the boys here in town but denies any disease." "Well," I said, "there must be others, for the boy I have in mind lives in Podunk."

A subsequent report from the family physician showed a 4-plus Wassermann and an acute gonorrhea. He then thanked me and asked me what he owed me, and I told him that was what we were for and advised him to take her on to her family physician.

APPOINTMENT OF COMMITTEE

On motion of Dr. E. R. Hardin, of Lumberton, the president appointed the following committee to draw up a uniform ordinance governing the use of individual drinking cups in drug stores, and to distribute this ordinance to the various health officers of the state: Drs. C. C. Hudson, J. W. Armstrong, and L. W. Corbett.

REPORT OF COMMITTEE ON RESOLUTIONS

L. J. Smith, M.D., Chairman

Your committee on resolutions offer the following:

(1) *Resolved,* that we extend to the Oceanic Hotel our appreciation for the courtesies shown us during our meeting here.

(2) *Resolved,* that the North Carolina Public Health Association express to Dr. W. S. Rankin, our former leader, our sympathy and regret because of his recent accident, which prevented his being with us on this occasion, and wish for him a speedy recovery; and be it further

Resolved, that a copy of this resolution be sent to Dr. Rankin by the Secretary.

(3) We wish to express our appreciation to Dr. Mark F. Boyd, of the International Health Board, for the splendid and instructive paper on malaria which he presented to us tonight.

(4) We wish to express to Dr. Wm. deB. MacNider, President of the North Carolina State Medical Society, our appreciation for the interest he has displayed in our organization, as evidenced by his presence and timely suggestions at this morning's session.

The report of the Committee on Resolutions was adopted.

REPORT OF THE COMMITTEE ON THE PRESIDENT'S ADDRESS

The committee has carefully considered the President's address and wishes to emphasize to the association its vital importance in every respect.

The health officer whose major attention is directed to his cost equivalent loses many of the most valuable features of any health officer—viz., the education of his people in the ways and means of promoting positive health and preventing disease. Health is a matter of education rather than legislation.

Your committee wishes to suggest that as a move toward making practical the vital points brought out in this address, this association memorialize the North Carolina State Board of Education, requesting

that some plan be perfected whereby credits obtained by examination in proficiency in the subject of health and hygiene be applied to teachers' certificates.

At present, this important phase of child development gets no credit and all that teachers do along this line is in excess of bona fide requirements. Hence teachers cannot be expected to take the same interest in child health as if it were made to influence their salaries.

As a further step toward making practical application of the suggestions made, your committee invites the serious consideration of this association to the matter of including credits in our present cost equivalent system for various important phases of health educational work. This will encourage the health officer to give to his educational work more effort and enthusiasm.

(Signed) E. R. Hardin, *Chairman,*
M. L. Townsend,
J. A. Morris.

The report of the committee was accepted.

ELECTION OF OFFICERS

The following officers were elected:

President—Dr. E. R. Hardin.....Lumberton
Vice-President—Dr. J. H. Hamilton.....Wilmington
Secretary—Dr. F. M. Register.....Raleigh

There being no further business to come before the Association, the the meeting adjourned *sine die.*